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A PATHOLOGIST SCRUTINIZES THE SPECIALTY BOARDS

THE WILLIAM W. ROOT LECTURE OF ALPHA OMEGA
ALPHA HONORARY MEDICAL SOCIETY

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It is commonly said, and with some truth, that the pathologist has the last word as to clinical diagnosis. This is not because he has superior intelligence but simply because he has direct access to the material, in contrast to the clinician, who thumps, feels and listens, looks through long narrow tubes with a tiny light at the end, inspects through a wound with his mind on the welfare of the patient and his thought on the clock, or depends on a photograph of the interior, vague as to definition and subject to various interpretations. The pathologist suffers none of these handicaps. His patient is not breathing, cannot feel pain and is not in danger of shock or exsanguination, his examination can be direct and thorough, and his time is limited only by the fact that he himself may die some time.

The correlation of clinical and postmortem results necessitates the cultivation of a critical mind, kindly, sympathetic, understanding and sound. In spite of many vicissitudes, the pathologist must keep his feet on the ground. If he is broadly interested in medicine, his critical nature is such that he may be of aid. It is for this reason that I have included in the title of this address "a pathologist scrutinizes." I have explained a few things about the pathologist and find that Webster defines "scrutinize" as meaning to "inspect or observe with critical attention." The pathologist spends his life in careful examination, in critical appraisal, in logical deduction and in an endeavor to make what he hopes are helpful suggestions. As a scrutinizer he usually attains a high rating. The scrutiny of the specialty boards at this time is a sort of stock taking with hope of building up, advancing and improving rather than with destructive intent. The pathologist may be cold blooded, but he has a warm heart, is patient and analyzes sympathetically. The boards are good and will be better, but they will do well to proceed with caution, guided by wisdom and not by emotion.

The history of medicine shows a progressive course of change in status of the physician. In the days of Greece and Alexandria he occasionally attained importance in the affairs of men and in some instances was actually deified. During the Middle Ages a few great lights appeared and were honored for their attainments. These were exceptions, and the general level

was low. Toward the close of the Middle Ages and in the early Renaissance, physicians as a group took a place in society on the same plane as the artisans and merchants. In various communities, guilds were formed and both physicians and surgeons served an apprenticeship before they became qualified freemen of their respective guilds. Although at about this time universities were established, an interrelationship between the guilds of medicine and the university courses of medicine was not yet formulated. Toward the end of the eighteenth century, certain quasilegal organizations were established, as in the case of the Royal Colleges of England, of Scotland and of Ireland, which became licensing bodies. There was no great regularity of sequence in these events; the development appears now to have been somewhat haphazard.

In the nineteenth century medicine slowly came into its own as a scientific discipline, and naturally schools and universities played a large part in its subsequent progress. Hospitals became an integral part of the teaching facilities. This period represents a development which for the most part was logical, and, as it went on, the apprentice system as the principal mode of training fell into the discard. The Flexner report led finally to the stabilization of medical education.

Prior to that report there were instances in which what was called medical training was loosely organized, conducted without adequate facilities and even prostituted for personal gain. This unfortunate situation led to the establishment of licensing boards designed to protect the public against incompetent graduates. With the advent of a new order following the Flexner report, medical education became a profession in the true sense. It was recognized that the conduct of a department in a medical school is not an avocation, as had previously been the practice, but a vocation in itself regardless of whether it was called full time or designated in some other way. A faculty member is now chosen because of training, promise, achievement and mastery of his field. Possessing these qualifications, the man must be a good guide for his students. With few exceptions the selection of professors is a free choice on the part of faculties, generally unhampered by university politics or nepotism. Freedom of selection, freedom of research, freedom in curriculums, freedom in pedagogic methods all guarantee continued progress in medical education. Examinations conducted by the present school personnel give assurance that those who graduate have been well trained. The licensing boards of the various states, formerly guardians of the public welfare, are now largely watchdogs over the faculties. Nevertheless, certain boards have seen fit to interfere with the freedom of action of medical schools to the extent of imposing certain rigid requirements as to courses and types of internship. This is not the place to discuss the merits of such a program, but some of the rulings savor of

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arrogance and can safely be said to be arbitrary. To be sure, these boards are within their legal rights, but they have not the distinction and knowledge in the field of medical education that would justify this exhibition of power. It is to be hoped that the specialty boards will scrupulously avoid similar action.

These remarks might be considered as divergent from our main purpose here. The development of the line of thought concerning the specialty boards needs this introduction. This is because the specialty boards, although in no sense concerned with legal requirements of states or nation, are bodies superposed on those boards which deal with licensure.

GROWTH OF THE SPECIALTY BOARDS

As medicine became more scientific, so it became more complex. Methods of diagnosis and treatment began to require a detailed attention that made it impossible for one person to be fully proficient in all fields. Thus arose specialism with its requirements of great skill in one field but, as a leading specialist has said, "so empty of so much." As experts in a given division increased in numbers, special societies were formed. Out of these grew the specialty boards. As early as 1913 the American Ophthalmological Society, the Section on Ophthalmology of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology appointed a committee on education in ophthalmology. This soon led to the problem of differentiation between ability and incompetence. The outcome was the creation in 1916 of the American Board of Ophthalmic Examinations, now known as the American Board of Ophthalmology. The otolaryngologists took similar action in 1924. In 1930 the American Board of Obstetrics and Gynecology, in 1932 that of Dermatology and Syphilology and in 1933 that of Pediatrics were established. During these years the National Board of Medical Examiners, a voluntary group of high minded men, had given extensive consideration to the problem of examinations for the specialties, and the Council on Medical Education of the American Medical Association took final action in establishing the Advisory Board. The earlier boards formed the model, and beginning in 1934 various other boards have been established. It is to be noted that these actions were initiated by medical men themselves. There were no pressure groups in lay organizations and no direction by governmental authority. The cooperation of the Council on Medical Education and Hospitals, various sections of the American Medical Association and numerous national medical societies, each made this program possible. Nothing that I might say could detract from the idealism, the self sacrifice and the practical applications which have become evident as the project has been put into practice.

On April 12 THE JOURNAL stated that on February 16 the Advisory Board had advanced the subsidiary boards of anesthesiology and of plastic surgery to the status of full and independent boards, bringing the total number of boards to fifteen. Since that time, but on a different basis, the American Board of Internal Medicine has appointed advisory committees of medical subspecialties in the fields of allergy, cardiovascular disease, gastroenterology and tuberculosis. It is important that each candidate in these subspecialties who wishes a notation on his certificate must first pass the examinations of the board. Members of the board will sit with the examiners in the subspecialties. This means that however much a candidate may wish to shine in his

small field he must first qualify as a competent physician. Thus, what at first glance looks like approval of specialization ad infinitum is not accepted by this board, and there is no immediate danger of realization of the old platitude about different specialists for each tonsil, at least as far as concerns the Board of Internal Medicine. Rumors are circulated, however, as to the desirability of boards for minor specialties, so minor in fact as to be of microcosmic proportions. There is even talk of a board for general practitioners, difficult as it is to define them or to keep them within such boundaries as may be established. The position of the Advisory Board in confronting and deciding these questions is certainly not enviable. It will require wisdom and determination for that board to avoid extremes. Not one of the boards is entitled to expose the profession or its specialties to ridicule.

DANGERS INHERENT IN THE SITUATION

The purposes of the boards are directed toward the elevation of the profession and the improvement of the practice of medicine, more particularly in the various major specialties. This is to be accomplished by requirement of certain terms and actual details of training. The boards are informed as to the training and other qualifications of candidates and, on examination, certify to their competence. Periodically, lists of those so certified are published. So far, so good, but what are the dangers? The boards are entirely voluntary and their activities supported by fees of candidates. There is no subsidy by any organization that might "tie strings" to gifts. This means that the boards are independent except as to certain items of supervision by the Advisory Board and the Council on Medical Education and Hospitals. Admirable as is this independence, it carries with it the hazard of dogmatic decisions and autocratic operation. Certainly the ideals and practical experience of the members of the boards should be a guaranty of wise judgments. The business man cannot understand why medical men take on such burdens as membership in the boards. He is unable to grasp the motives which lead medical men willingly to make the required sacrifice of time and energy without financial recompense or any other reward, as far as I can see, except the satisfaction of a duty well performed. A prerequisite for this service is enthusiasm, an enthusiasm which may reach such emotional heights as to be prejudicial to the very objectives of its ardor. The enthusiast must ever guard against becoming a zealot. The boards should be aware of this danger and avoid setting standards at a level which could be attained only as senility begins to lay its heavy hand on intellect.

Modern medical school education has departed in large measure from the apprentice system. The preceptor is no more. The boards, however, have returned again to the policy of apprenticeship. It is difficult to see how any candidate can procure the required training unless he attaches himself to one or a few distinguished persons in the field. His novitiate over, he passes the examinations and is certified as competent. He becomes a freeman, nominally if not actually, of the same standing as his teacher. The danger lies in the formation of a guild or, in modern terms, a labor union. The members of the boards are representatives of special societies, which these new freemen usually enter. They therefore reflect to some degree the views of the societies. No one could deny these organizations the right to look after the professional, economic and social interests of their members, but if they form pressure

groups they may well defeat themselves. The labor union has no place in the medical profession or any of its divisions, and if the specialty boards were to favor such a development they would do harm rather than good. Witness the decision that only those who hold the certificate of the American Board of Orthopedic Surgery are eligible for appointment in the forwarding of a state program. The result is alleged to be pressure to lower the standards of the board and, it may be said candidly, injustice to those who for one reason or another are not certified even although qualified for the job in hand. This situation is hardly the fault of the board but indicates how its work may be threatened.

Vaguely indicated was at one time the proposal that hospitals accept on their staffs only those certified by the boards. This suggested infringement of the inherent right of a hospital to determine for itself how the staff should be selected was not carried into effect and should not be. The prompt reaction on the part of at least one hospital was the public announcement that it would not adhere to any such edict. If such a program is ever to operate, it must be inaugurated by the hospitals rather than by instruction from the boards.

Admirable is the voluntary character of the boards, and this feature is properly emphasized. The members are voluntary workers. The specialists are free to take the examinations or not, as they choose. There is no clear indication that the boards wish to depart from this plan. They should scrupulously avoid any departure in the future from this voluntary feature and do what they can to discourage pressure in that direction by others. The whole program is so highly meritorious that the weight of its own excellence is sufficient to achieve the desired ends.

SPECIAL TRAINING

The boards have prescribed certain items of training both as to the clinics and as to the basic sciences. The specifications for the clinical work are clearly outlined. Presumably they represent a minimum as concerns time and material. They may perhaps do an injustice to brilliance. It is at least to be suggested that there may be a certain reduction of rigidity in special cases. There is an institutional reluctance to accept responsibility for determination of special cases as illustrated by age limits in universities and the like. If the boards are to favor a degree of elasticity, the members are then confronted with decisions which require no small amount of courage. They have it and should use it.

The requirements in the basic sciences are nowhere clearly specified. The phrase "intensive training" in these fields is used by several boards. This looks well in the booklets, but the candidates and in some instances the board members themselves are at a loss as to its exact meaning. It is of course absurd to think that a trainee in the time at his disposal can have "intensive training" in anatomy, physiology, biochemistry, bacteriology and pathology. This is particularly true if intensiveness has anything to do with extensiveness. Designed for the field of a specialty, it presupposes that the man has carried through the clinical years of his medical school days and the period of his general internship a considerable sum of knowledge of these sciences, which experience shows not to be true. The special features of these sciences can be appreciated only with a good background of the general aspects.

In the practical work of the boards, much emphasis is placed on pathology. In many instances special pathologists, as indicated by some of their publications, are encumbered by deficiencies in knowledge of general

pathology. I am convinced that an adequate grasp of the pathology of any special field requires a good background of general pathology. I am also convinced that this should be given due weight in the preparation for the specialty boards. Most of the young persons for whose training I am responsible, including those who are headed for the clinical divisions, accept this view without hesitation. It may not be unjust to indicate that something of this sort is recognized by those boards in whose program the examinations in pathology are conducted by the clinical men. Furthermore, I realize fully that this method may be dictated by uncertainty as to the type of examination that might be given in the special field by the general pathologist.

Certainly the practitioner of a specialty should know the nature of the diseases which affect his patients. Equally, he should be able to recognize the alterations of form and function. The danger lies in the possibility that, when he has had the usual cursory study and has passed the examination, he may consider the incident closed and not realize that it is only preparatory to further study. This danger is much more likely to operate in the basic sciences than in the clinical divisions. I have known excellent clinicians who had a year of pathology five, ten and twenty years ago who carry with them the idea that they know the pathology of today. They are mistaken, because they have not continued with the practice of pathology or followed its literature. This cannot be passed off with the comment that the patients are dead and the implication that the pathologist is essentially the same, for most of the work of the practicing pathologist deals with living patients. He himself is very much alive to the continuing advances in his field. Pathology is no more static than any other branch of medicine, and it cannot be learned in six easy lessons. Its study must continue throughout the physician's life, whether he is clinician or professional pathologist. A member of one of the boards states that he has learned more pathology in the last ten years than he learned in the preceding twenty. Without discourtesy to this distinguished physician, it might be that his membership in the board has stimulated him to keep ahead of the candidates. All that aside, the boards must determine and put in direct simple language their requirement in the basic sciences, and this should be on the basis of what can reasonably be accomplished rather than on an ideal impossible to attain. "Steer then with good strong hand and wary eye, O helmsman."

These particulars are only incidental to a more fundamental thought. It is essential in a practical way to set a certain course of training and to require evidence that it has been followed profitably. It is equally essential to recognize the fact that only a few of the members of the boards have done so themselves. Without exception they are persons of real distinction in their fields. They became so because they sought and worked, they had a plan and followed it. They had an ideal and usually were guided by some one who had achieved a position of importance. By and large, however, they did not follow a program laid down for them by authority. They attained mastery of their specialty by the exercise of initiative. The only limit to their initiative was opportunity, and over and over again, by their own energy, they created opportunity. In a sense they have arrived, but the habits they formed in their earlier days still operate to drive them toward higher levels. These are the people Osler had in mind when, in a discussion of continuous education of general prac-

tioners, he said "the specialist may be trusted to take care of himself." They often think that they might have been better off if they had had greater experience in this or that sphere and forget that in a productive career there is a limit to coverage of all knowledge. And they also forget that their freedom, coupled with the initiative they exhibited, was basic to their advancement. They should prescribe programs of training, but they must still leave such a degree of flexibility that freedom and initiative even if not fully granted will be restricted in the smallest possible degree. Our graduate pupils are our sons in science and for the time being we are in loco parentis. We may guide our pupils but we must not drive them. By precept and example we can set a goal for them. We must not forget that they are individuals and that their success lies within them. They do their best without too tight a rein.

Let nothing I have said be construed as adverse criticism, for such is not the case. Those who conceived the boards, those who constitute and operate them are unselfishly striving for the improvement of a truly great profession. They have been actuated by the highest ideals and have proved wise in their decisions. As with all men of enthusiasm and imagination, they have occasionally "talked out of school," but their fervor has not led them astray. They have welcomed constructive suggestions as to their technics of procedure. Their heads have been held high and their feet solidly on the ground. They must, however, be constantly on guard that their authority is not transmuted into autocracy. "The letter killeth, but the spirit giveth life."

DIFFERENTIAL DIAGNOSIS BETWEEN LIPID PNEUMONIA AND PUL- MONARY NEOPLASM

REPORT OF A CASE: TREATMENT BY
PARTIAL LOBECTOMY

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The possible similarity of lipid pneumonia to pulmonary neoplasms from the roentgenologic and clinical aspects has been mentioned in publications describing the production of acute and chronic pulmonary lesions by lipids in infants, children and adults.¹ The clinical and pathologic features of lipid pneumonia in infancy and childhood have gained widespread recognition, but the lesions that occur in adults are extremely variable and have not been so well defined. The case to follow, of localized lipid pneumonia simulating a pulmonary neoplasm in an adult, is the first recorded instance of a surgical cure of this condition.

The surgical therapy came about by chance, and it seems to us, in retrospect, that the diagnosis of lipid pneumonia could possibly have been made earlier in the case reported herewith. A complete preliminary study suggested a malignant condition of the lungs to be the most likely diagnosis. Operative intervention with lobectomy in view was therefore undertaken.

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1. Goodwin, T. C.: Lipoid Cell Pneumonia, *Am. J. Dis. Child.* 48: 309 (Aug.) 1934. Fischer-Wasels, B.: Tödliche Lungenschrimpfung durch Gebrauch von Mentholöl, *Frankfurt. Ztschr. f. Path.* 44: 412, 1933. Houck, G. H., in *Medical Papers Dedicated to Henry Asbury Christian*, Baltimore, 1936, p. 463. Klink, G. A., Jr.: Lipoid Pneumonia, *Albany M. Ann.* 55: 71 (June) 1936. Graff, Ikeda.

When the pulmonary tissue was seen and felt it did not have the gross appearance of a tumor, so a biopsy was immediately done. The resulting conclusions were totally against the existence of a malignant growth and in favor of an inflammatory process highly suggestive of reactions to lipids. Since no mediastinal nodes were seen a partial lobectomy was performed. The ultimate essential cure of the patient ensued, and the final pathologic diagnosis was lipid pneumonia.

The differential diagnosis involved and the unusual procedure undertaken make us consider the report of this case and the accompanying discussion to be of interest.

REPORT OF CASE

History.—J. B., a Jewish man aged 48, entered Mount Zion Hospital Nov. 13, 1939 in the private service of Dr. George Herzog, with lung trouble of nine years' duration.

An attack of pneumonia in 1930, while he was in a cast under treatment for pain in the lower part of the back, was followed for several months by cough and the expectoration of sputum in the mornings. These disappeared and he was free of symptoms until 1932. At this time, and again in 1934, he had episodes of fever and a dry, hacking cough. After the last attack he had many "colds," a constant cough with sputum and some shortness of breath. There were no hemoptysis, chills or sweats. He had not checked himself for daily changes in temperature. In the past year he had begun to have nocturnal sweats, which for the past two months had occurred nightly. A "cold" in the past two days had increased the amount of sputum, and for the first time it was blood streaked. He admitted having used large amounts of oily nose drops for many years.

His mother and one brother died of "asthma," and two brothers and one sister have asthmatic symptoms.

His antrums had been irrigated every few months, and he had had nasal polyps removed, a submucous resection and a hemorrhoidectomy. An attack of rheumatism involved both wrists, the right knee and the left ankle in 1925.

Examination.—The patient was thin, bald, anemic appearing and cooperative. There was a nasal polyp in the right naris, and the nasal septum was perforated. No teeth were present. The thorax was symmetrical, but on respiration the left costal margin lagged. Dulness on percussion was present only over the lower part of the left side of the chest posteriorly. In this region there were many fine, moist rales, the breath sounds were diminished in intensity and the respiratory note was prolonged. A short, harsh, systolic murmur was present over the mitral area. No masses or organs were palpable in the abdomen. No other significant physical abnormalities were present.

The blood showed leukocytes 10,350, with a normal differential count, erythrocytes 4,390,000 and hemoglobin 88 per cent (Sahli). The urine was normal. The Wassermann and Kahn reactions of the blood were negative. Tubercle bacilli could not be found in the sputum on several direct examinations, and inoculation in the guinea pig gave negative results. The electrocardiographic tracing showed a normal rhythm with a tendency to a deviation of the right axis and a slight depression of the ST complex in leads 2 and 3. The conclusion was that there was no positive evidence of myocardial damage.

A roentgenographic examination of the chest revealed an area of density at the base of the upper lobe of the left lung extending anteriorly. This was interpreted as probably either a pneumonic process or a partial stenosis of a bronchus by a neoplasm (fig. 1).

The patient remained in the hospital for eight days, during which time he had several nocturnal sweats but no fever. The sputum remained blood tinged but had decreased in amount. The physical condition of the chest did not change. He was discharged unimproved and referred to the thoracic clinic of the University of California outpatient department for follow-up examinations.

A bronchoscopic examination was performed by one of us (A. L. B.) on December 5, in this clinic. The trachea and primary bronchi appeared slightly reddened; excess secretion

came from the bronchus of the lower lobe of the right lung and the bronchi of both lobes of the left lung. Beginning at the carina and including the left primary bronchus and its bifurcation, the tissues were edematous, thickened and slightly more firm in consistency than was normal. This thickening narrowed the lumen of the bronchus of the upper lobe of the left lung by one fourth of its diameter. A specimen of this

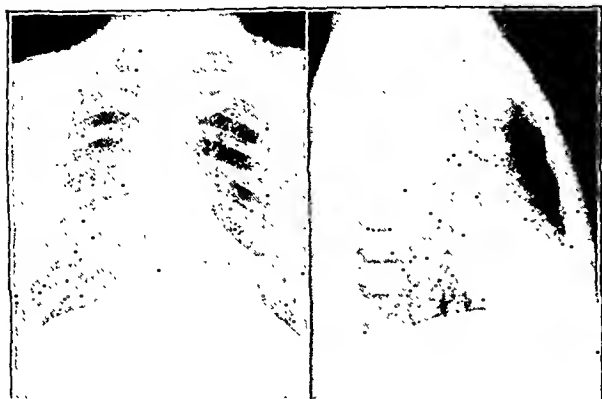


Fig. 1.—Anteroposterior and lateral views of the chest on Nov. 27, 1939, showing fairly discrete areas of increased density of the lingula of the upper lobe of the left lung with some pneumonitis in the right pulmonary field.

mucous membrane was taken for biopsy. No displacement or distortion of the bronchi was noted.

Pathologic examination showed the bits of tissue to be covered by respiratory epithelium and to contain scattered lymphocytes and small mononuclear cells in the subepithelial fibrous stroma. There was no evidence of a malignant growth.

The patient reentered Mount Zion Hospital on December 9 and stated that the cough and sputum had decreased but that a postnasal drip had become more profuse. The nocturnal sweats had continued, but with less regularity; slight dyspnea on exertion had become evident, but no hemoptysis or blood-streaked sputum had been noted. An intermittent feeling of pressure unrelated to exertion had appeared in the left portion of the chest at the level of the nipple line. Examination of the chest revealed the same condition noted in the first entry. The vital capacity was 4,000 cc. No significant changes from the conditions originally noted in the laboratory had occurred.

Comment.—At this point in the study of the patient it was felt that we were dealing with a man who had had numerous respiratory illnesses, who was becoming progressively more incapacitated and in whom a suggestion of a pulmonary malignant growth appeared to be a definite possibility. This opinion was based on (1) the presence of blood in the sputum, (2) the localized lesions noted by means of roentgenograms, (3) the progressive downhill course of the patient, (4) the inconclusive bronchoscopic examination and biopsy done on material taken with a bronchoscope and (5) the other examinations giving negative results, in particular those for specific pulmonary inflammatory diseases. It must be admitted that insufficient consideration was paid to the history of the use of oily nasal sprays over a period of nine years, although this alone would not have deterred us from our subsequent course. Exploratory thoracotomy, with the possibility of lobectomy for a malignant growth of the lung, was therefore undertaken.

Operation.—December 14, after a preoperative diagnosis of questionable tumor of the lung, exploration of the chest and partial lobectomy were done; avertin with amylene hydrate and cyclopropane being used as an anesthesia. After the patient was supported on his right side with sandbags, an intratracheal tube was inserted. The anterior, lateral and posterior portions of the left side of the chest were prepared with merthiolate and draped in the usual manner. The skin was incised in the sixth interspace on the left side, the incision extending from the lateral third of the posterior part of the left side of the chest to the lateral third of the anterior part of the left side of the chest. The incision was developed through the subcutaneous fascia and intercostal muscle. Bleeders were

clamped as they were encountered and tied with no. 000 catgut. The parietal pleura was then exposed and incised. In order to enlarge the operative field, about 4 cm. of the sixth and seventh ribs at the posterior portion of the incision were excised and a self-retaining retractor was placed in the wound. The lingula of the upper lobe of the left lung was brought into view, and two indurated areas were palpated in its dependent portion. The rest of the lobe was explored, but no abnormalities were found. No unusual mediastinal nodes were distinguished.

The lowest third of the lingula was clamped and tied with continuous and interrupted chromic catgut, and the distal portion was excised. The visceral pleura was approximated over the cut surfaces of the lung with chromic catgut. The lung was inflated, but the lobe on which operation had been done did not expand fully, remaining somewhat collapsed. There was no bleeding from the operative site of this lobe, and no escaping air was detected when saline solution was poured over the lobe. The wound was closed by approximating the sixth and seventh ribs with interrupted chromic catgut. The intercostal muscles and fascia were approximated in the same manner. The superficial fascia was closed in the usual manner with continuous no. 00 catgut and the skin with Michel clips. A sterile bandage was applied.

A bronchoscope was then passed, and a small amount of mucous material was aspirated. No mucous plug was removed. The patient was returned to the ward in good condition.

Pathologic Examination.—The specimen consisted of a pyramidal shaped lobule of lung measuring 11 by 9 by 4 cm. The pleura was irregularly thickened in some regions. There were no adhesions. The tissue was irregularly firm in consistency, with some soft areas. On section the parenchyma in the firm regions did not contain air and appeared atelectatic and somewhat indurated, but the only grossly visible fibrous tissue appeared as fine scattered strands. Other regions showed the tissue to be relatively normal but atelectatic.

Microscopic Examination: Numerous blocks from all parts of the lobe were fixed in Zenker's solution and 10 per cent solution of formaldehyde, embedded in paraffin and stained with hematoxylin and eosin. Frozen sections were stained with scarlet red and osmic acid. The alveoli varied considerably in structure and content in different portions of the lobe; in some areas they were normal. In most regions the alveoli contained distinct globular spaces surrounded by a fine fibrous stroma. Adjacent regions often showed moderate atelectasis, and the partially collapsed alveoli were filled with fat globules, fibrous tissue and macrophages containing fat and hemosiderin. Some of the alveolar walls were thickened by an irregular layer of fibrous tissue embedding smaller globular spaces. Occasional,



Fig. 2.—Anteroposterior and lateral views of the chest on March 20, 1940, three months after operation, showing complete expansion of a clear field of the left lung with considerable clearing in the field of the right lung.

scattered alveoli were completely filled by whorl-like bundles of fibrous tissue. The interlobular, peribronchial and perivascular connective tissues were thickened by irregular strands of scar tissue and contained focal collections of lymphocytes. Some bronchi were definitely enlarged, with lymphocytes and small mononuclear cells scattered throughout the increased fibrous tissue of the subepithelial and muscular layers.

The globular spaces in the alveoli and in the macrophages noted in the paraffin sections were deeply stained by scarlet red on frozen section. Fine droplets of fat were brought out by this method in the bronchial epithelial cells. Droplets of fat were present also in some of the whorl-like bundles of scar tissue filling some of the alveoli and in the fibrous tissue thickening some alveolar walls. These droplets of fat were not stained by osmic acid, indicating that this was a saturated lipid, probably liquid petrolatum. An iron stain showed the presence of hemosiderin in macrophages in some parts of the lung. The pathologic diagnosis was chronic lipid pneumonia.

Subsequent Course.—The immediate postoperative period was uneventful, and the patient was discharged from the hospital on the twenty-second postoperative day. He regained his strength, gained 6 pounds (2.7 Kg.) and six weeks after the operation returned to his usual full time occupation. In the eighteen succeeding months he has had no recurrence of any pulmonary complaints or colds and has discontinued the use of oily nasal sprays. Roentgenographic examinations in this period showed that almost all the involved portion of the upper lobe of the left lung had been removed, the remaining scarred areas slowly disappeared and the pulmonic fields became normal (fig. 2). A recent physical examination of the chest revealed no abnormalities.

COMMENT

The histologic differentiation between the effects of aspirated animal, vegetable and mineral lipids in the lung has been carefully and minutely described by several observers. The neutral vegetable oils have been shown by Pinkerton² to be practically innocuous. The animal oils cause a reaction as to a foreign body, with the elicitation of macrophages and giant cells; fibrosis is not a conspicuous feature. Liquid petrolatum in adults generally produces scattered granulomatous nodules associated with foamy macrophages.

Graef³ correlated the histologic reaction with the chemical nature of the extracted lipids. He described the histologic characteristics of the acid-fast membrane formed from aspirated cod liver oil, and in 2 instances confirmed the interpretation by chemical extraction. He showed that liquid petrolatum can be differentiated from the animal oils in the tissues by the absence of the acid-fast membrane and the inability of the former to become blackened with osmic acid. In 5 instances the presence of liquid petrolatum was proved by chemical extraction of pulmonary tissues in which it was considered implicated on histologic grounds.

The distribution of the pulmonary lesions resulting from the aspiration of liquid petrolatum by adults was described by Bromer and Wolman⁴ as occurring in the perihilar region, in the posterior portion of the lungs and to a greater degree in the right lung than in the left. Others have noted the localization of the lesions in only a part of one lobe.⁵ In this instance clinical and roentgenologic evidence pointed to a limitation of the lesion to one lobe. No explanation has been offered to cover the variations seen in adults; it may be possible that the constant aspiration of small amounts over a long period tends to form discrete localized lesions, whereas the rapid introduction of large amounts of liquid petrolatum produces a diffuse and extensive lesion.

The histologic changes in lipid pneumonia are essentially clearcut and specific, so that biopsy done on material taken with a bronchoscope from the neighborhood of the lesion may give the diagnosis. We reviewed the microscopic preparations of the material obtained during the bronchoscopic examination with this in mind, but no characteristic cells were found. However, it may be possible in some instances to recognize this condition during a biopsy done on material secured with a bronchoscope.

In this particular instance the value of performing a partial lobectomy is well illustrated. There was saved to the patient a major portion of the upper lobe of the left lung. Subsequent roentgen examinations have shown a gradual clearing of the scarred area, so that at present the pulmonic field is essentially clear.

SUMMARY AND CONCLUSION

1. In a case of localized lipid pneumonia the working diagnosis had been a probable malignant growth of the lungs.
2. The occasional similarity between lipid pneumonia and pulmonary malignant growths is noteworthy.
3. The possibility of lipid pneumonia must always be considered when an unconfirmed diagnosis of a malignant pulmonary growth is entertained.
4. It is important to question the patient specifically concerning the use of oily nasal sprays or other oil-containing remedies in the presence of unusual pulmonary lesions.
5. Bronchoscopic biopsy has a possible diagnostic value in the diagnosis of lipid pneumonia.
6. Partial lobectomy has a conservative value in instances of localized lipid pneumonia.

490 Post Street.

THE CLINICAL STATUS OF A GROUP OF NEGRO SHARECROPPERS

J. W. THOMPSON, M.B., CH.B.

BOSTON

Dill and his associates¹ have submitted for publication physiologic studies of a group of Negro sharecroppers; this paper is written primarily as a clinical appendix to those reports. The persons studied were selected by Dr. I. I. Pogue, the resident physician retained by the Delta and Pine Land Company on its plantation located at Scott, Miss. Aside from restricting the group to male Negroes within certain age limits (17 to 24) living on this plantation, the selection was made at random among the sharecropper families. A family and personal history was obtained from each subject and a routine clinical examination performed. All negative observations are omitted from this report, and the positive ones are compared with data obtained on a group of Harvard students by Dr. Clark Heath. The exacting criteria required to be met for admission into Dr. Heath's series render these persons well above the average from a medical point of view, and therefore they represent more nearly an "ideal white standard" than a control group. Most of the comparative data are contained in the accompanying table.

From the Fatigue Laboratory, Morgan Hall, Harvard University.
1. Dill, D. B.: Fatigue Studies Among Mississippi Sharecroppers, *Harvard Alumni Bull.*, Oct. 20, 1939. Dill, Wilson, Hall and Robinson, Forbes, Johnson and Consolazio.² Forbes, Dill and Hall.³ Robinson, Dill, Harmon, Hall and Wilson.⁴

2. Pinkerton, Henry: Fats and Oils: Their Entrance-Into and Fate in Lungs of Infants and Children; Clinical and Pathologic Report, *Am. J. Dis. Child.* 33: 259 (Feb.) 1927; Reaction to Oils and Fats in Lung, *Arch. Path.* 5: 380 (March) 1928.

3. Graef, Irving: Pulmonary Changes Due to the Aspiration of Lipids and Mineral Oil, *Am. J. Path.* 11: 862 (Sept.) 1935; Studies in Lipid Pneumonia: Lipid Pneumonia Due to Cod Liver Oil: Lipid Pneumonia Due to Liquid Petrolatum, *Arch. Path.* 28: 613 (Nov.) 1939.

4. Bromer, R. S., and Wolman, I. J.: Lipid Pneumonia in Infants and Children, *Radiology* 32: 1 (Jan.) 1939.

5. Ikeda, K.: Lipoid Pneumonia of Adult Type (Paraffinoma of Lung): Report of Five Cases, *Arch. Path.* 23: 470 (April) 1937.

In addition to what is mentioned in the table, the following conditions were found on physical examination of the Negroes. The commonest disorder was severe pyorrhea; in 50 per cent of the subjects, in spite of the excellent appearance of the teeth, purulent matter could be pressed out easily from the gingival margins, which bled readily on slight pressure. In spite of this continuous source of infection, the subjects rarely gave a history of sore throat, and the low incidence of tonsillectomy requires no further comment. Individual abnormalities observed were as follows: One subject (W. B.), a house servant, complained of inordinate fatigue. He had a generalized annular eruption of the skin, the edge of his liver was palpable 2 inches (5 cm.) below the costal margin, and in addition to his poor physique the tarsal arches on both sides were completely collapsed; he was the only poor specimen in the group and the only one who did housework in preference to work in the field. The Kahn reaction was positive; he was the only person with previously undiscovered syphilis in this group. Only 1 other patient with syphilis (R. B.) was seen; he had been undergoing treatment for some time. Another subject (C. A.) complained of nocturnal enuresis until his fourteenth year, of severe periodic headaches and of occasional seizures. There was 1 albino (J. S.) who presented signs of early pellagra. The right apical region of 1 subject (M. B.) was dull on percussion, with diminished breath sounds, but no rales could be heard. The same region of another (C. F.) was definitely hyporesonant on percussion, and vocal resonance was increased, but there were no accompanying breath sounds. In the complete absence of all other manifestations of pulmonary pathologic conditions, no significance was attached to these symptoms. The apical beat of 1 subject (A. G.) was well outside the midclavicular line; it was a systolic retracting beat accompanied by a rough systolic murmur heard best at the apex but audible over the entire precordium; on roentgenologic examination this subject's heart was found to be of normal size. Three subjects (G. B., A. P. and B. C.) had had symptoms highly suggestive of gonococcal arthritis, the first 2 having been hospitalized with this as a diagnosis. Lastly, the right forearm of 1 subject (J. A.) had been amputated as the result of trauma.

COMMENT

In view of the manner of selection and the information gathered from physicians in the district, it is probably quite safe to say that these subjects fairly represent young adult Negro sharecroppers on a well ordered plantation. The facts that Negroes come from afar seeking houses on the plantation of the Delta and Pine Land Company and that their houses, once secured, are not often vacated voluntarily indicate that the sharecroppers' lot is more favorable here than on some other plantations. Under conditions existing on the Delta and Pine Land Company's plantation the sharecropper does not compare unfavorably in physical status with a person of the same age who has enjoyed most hygienic advantages of the present day.

As may be seen from the table, two thirds of the experimental subjects were born during the summer months. This majority is in all probability the result of a greater number of conceptions occurring during the winter months and a lower infant mortality during the summer months. It is noteworthy that the mortality of siblings is five times that of the white group, although the Negro has twice the number of living siblings.

That the expected longevity is roughly the same in the two groups is suggested by the approximately equal number of living grandparents. The difference in the number of childhood diseases suffered by persons of the two groups is striking; in part, the explanation lies in the greater early mortality in the Negro families, allowing only those most resistant to reach a more mature age. Unquestionably it would require a much larger series in order to establish some of these points on a statistically acceptable basis. They are recorded here only as suggestive and interesting data. Some doubt, however, is certainly cast on the prevalent notion that Negro sharecroppers are apt to be in a lamentable state of ill health.

The laboratory observations which have a bearing on the physical status of the Negroes are as follows: The hemoglobin content of the blood is roughly 8 per cent lower than that in white persons; this difference was

Comparison of White Persons and Negroes

	White	Negro
Number of subjects.....	20	24
Average age, years.....	20	20
Average height, cm.	183	175
Average weight, Kg.	69.7	63.2
History:		
Birth month, 4th to 6th, percentage.....	20	74
Childhood diseases, average number per subject...	4	0.4
Hospitalization		
Percentage of subjects hospitalized.....	20	50
Total number of hospitalizations.....	4	15
Tonsillectomy, percentage of subjects.....	50	4
Commonest diseases		
Malaria, percentage of subjects.....	0	71
Average age.....	..	14
Gonorrhea, percentage of subjects.....	0	63
Average age.....	..	18
Wassermann reaction positive, percentage of subjects.....	0	8
Family:		
Siblings living, average number per subject.....	2	4
Siblings dead, average number per subject.....	0.2	1
Father living, percentage of subjects.....	100	80
Mother living, percentage of subjects.....	95	70
Grandparents, percentage living.....	20	21
Grandparents, percentage unknown.....	0	17

found between the white laboratory staff and sharecroppers on the one hand and Negro students and sharecroppers on the other.² Furthermore, the total white cell count of the Negro was remarkably low, with a greater diminution in the number of polymorphonuclears than in that of other cells.³ Though having no obvious medical significance, it is a curious fact that the volume of interstitial fluid when referred to surface area averaged about one fourth higher in the Negro sharecropper than in the white subject.⁴ For a complete account of the comparative physiologic ability of the Negro and the white to do work, the reader is referred to the paper of Robinson and his associates,⁵ in which a number of interesting comparisons are drawn between these two groups during moderate and severe exertion. They found in part that the Negro between 14 and 19 years of age had greater endurance than the white subject in the performance of severe work and was at least as capable as the white in all age groups studied in the execution of both moderate and severe work.

2. Dill, D. B.; Wilson, J. W.; Hall, F. G., and Robinson, Sid: Properties of the Blood of Negroes and Whites in Relation to Climate and Season, *J. Biol. Chem.* 136: 449, 1940.

3. Forbes, W. H.; Johnson, R. E., and Consolazio, F.: Leukopenia in Negro Workmen, *Am. J. M. Sc.* 201: 407 (March) 1941.

4. Forbes, W. H.; Dill, D. B., and Hall, F. G.: The Effect of Climate upon the Volumes of Blood and of Tissue Fluid in Man, *Am. J. Physiol.* 130: 739, 1940.

5. Robinson, Sid; Dill, D. B.; Harmon, P. M.; Hall, F. G., and Wilson, J. W.: Adaptations to Exercise of Negro and White Sharecroppers in Comparison with Northern Whites, *Human Biol.* 13: 139, 1941.

Curiously enough, they also found that the Negro cannot supply oxygen to the tissues at as great a rate as the white person during severe work; hence, in surpassing the performance of the white workers he builds up a greater oxygen debt. It may be seen, therefore, that these laboratory data support the clinical impression noted previously.

CONCLUSIONS

1. The Negro sharecroppers who have been the source for this report were all, with one exception (W. B.), in good general physical condition.

2. It is believed that this group does not differ significantly from the majority of Negroes working on first rate plantations.

3. The physical status, apart from gonococcal infections, of the plantation Negro is, at least in certain areas, not far below the standard of excellence in a white group.

15 Holyoke Street.

VITALLIUM SKULL PLATES

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Defects of cranial bone are not uncommon. All sorts of materials have been used in attempts to close these defects during the past four centuries. Animal bone,¹ celluloid,² aluminum,³ gold,⁴ silver,⁵ platinum,⁶ autogenic⁷ and heterogenic⁸ bone grafts, cartilage,⁹ sliding grafts of cranial bone,⁹ decalcified bone,¹⁰ buttons of bone¹¹ and chips of bone¹² have been used.

There has been a great variation of opinion concerning the use of these materials. Most of the materials caused a reaction as to a foreign body and sloughed out or had to be removed. This is particularly true of all the materials except autogenic bone grafts. Because of this reaction all operations involving metal plates had been discarded. Grant and Norcross¹³ have made an exhaustive search of the literature on this subject and

have described all the known methods of cranioplasty with the use of these various materials. Some 1,385 cases were charted in this survey to try to determine the best method. "The only figure from the entire group that is at all significant is the mortality rate, which is 0.73 per cent." The reader can get the complete history and the technic of the various procedures by referring to their paper.

The theoretic requirements of a skull plate should be (1) rigidity equal to that of the bone that it replaces, (2) absence of reaction between the bodily tissue and the metal plate, (3) immobility of the plate once it is inserted and (4) ease of insertion at operation.

TYPES OF SKULL PLATES USED

Metal Plates.—The first metal plate to be used was made of aluminum and was inserted by Booth and Curtis¹⁴ in 1893. The patient died ten days after the operation. Gold, silver and platinum have been inserted into cranial defects. Silver plates 96 per cent chemically pure produce little or no reaction in bone.¹⁵ However, at the end of three or four years there is some reaction on account of the 4 or 5 per cent of impurities.¹⁵ Silver of this purity is so soft that it does not have the necessary rigidity for protection. Gold and platinum have been tried, but there are no electrolytic studies available on these metals when used in vivo. Grant and Nor-

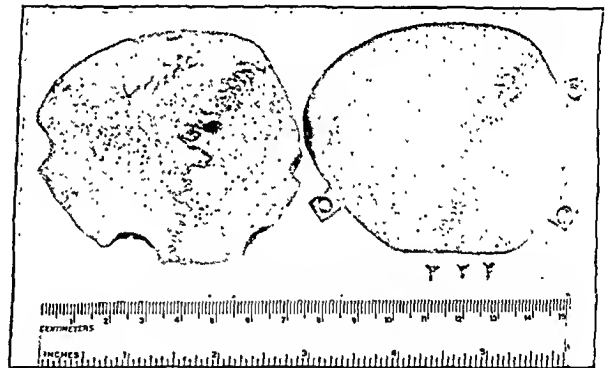


Fig. 1 (case 1).—Outer surface of osseous flap and vitallium plate. Countersunk lugs and flat-headed screws are shown half actual size.

cross¹³ have not considered metal plates in their discussion on the comparison of methods of cranioplasty. Metal plates have not been successful up to the present time, and the method has been discarded.

Celluloid.—Grant and Norcross,¹³ Mixer,¹⁶ Pringle¹⁷ and Henschen¹⁸ have objected to the use of celluloid because it is not rigid and because the graft has softened and become ineffective.¹⁸ I have examined several patients on whom it has been used. The plates crackle and buckle on palpation, which is a decidedly unpleasant sensation, and they are not strong enough to give protection against pressure.

Cartilage.—This is well tolerated and rarely absorbs, but it is never rigid.⁸ A small defect may be covered satisfactorily with it.

Autogenic Bone Grafts.—The method of choice for small defects under 6 by 6 cm. is a pericranial graft.¹³

Austenal Laboratories, Inc., 34 West Thirty-Third Street, New York, furnished the vitallium plates used in the cases described.

1. Babcock, W. W.: "Soup Bone" Implant for the Correction of Defects of the Skull and Face, *J. A. M. A.* 69: 352 (Aug. 4) 1917.
2. Link, I.: Casuistische Beiträge zu Heteroplastik beim Schädeldefekten mit Zelluloidplatten nach Fraenkel, *Wien. med. Wchnschr.* 46: 950, 1896. Hinterstoisser, H.: Ueber einen durch Trepanation geheilten Fall von traumatischer Epilepsie (Jackson) nebst Bemerkungen zur Heteroplastik mittelst celluloid, *Wien. klin. Wchnschr.* 4: 303, 1891.
3. Elsberg, C. A.: Plate for Defects of the Skull, *Ann. Surg.* 47: 795, 1908. Borchard: Zur subaponeurotischen Deckung von Schädeldefekten nach von Hacker-Durante, *Arch. f. klin. Chir.* 80: 642, 1906.
4. Estor, E.: Cent cas de prothèse crânienne par plaque d'or, *Bull. et mém. Soc. de chir. de Paris* 43: 463, 1917. Gerster, A. G.: Heteroplasty for Defect of the Skull, *Tr. Am. Su. Soc.* 13: 415, 1895.
5. Little, A. D.: An Operation Unique, Having Been Performed But Once (Removal of Silver Plate from Cranium), *J. M. A. Georgia* 8: 79, 1918. Mitchell, A. B.: Repair of Injuries to the Skull by Perforated Plates, *Brit. J. Surg.* 5: 40, 1917. Rawlings, L. B.: The Surgery of the Skull and Brain, London, H. Frowde, 1912, p. 198.
6. Corniolli, C.: A propos de la cranioplastie, *Rev. méd. de la Suisse Rom.* 49: 677, 1929.
7. Seydel: Eine neue Methode, grosse Knochendefekten des Schädels zu Deckung, *Zentralbl. f. Chir.* 16: 209, 1889.
8. Bégouin, P.: Cranioplasties: Résultats éloignés, *Bull. et mém. Soc. de méd. et chir. de Bordeaux* (1920), 1921, p. 88. Chutro, P.: Résultats de la cranioplastie, *Bull. et mém. Soc. de chir. de Paris* 43: 481, 1917.
9. Müller, W.: Zur Frage der temporären Schädelresektion an Stelle der Trepanation, *Zentralbl. f. Chir.* 17: 65, 1890. König, F.: Der knöcherne Ersatz grosser Schädeldefekte, *ibid.* 17: 497, 1890. Bunge: Ueber die... traumatischer Schädeldefekte an deren Deckung, *Arch. f. klin. Chir.* 17: 497, 1890.
10. Kumm... nplantation, *Deutsche. med. Wchnschr.* 17: 389, 1891.
11. Burrell, H. L.: The Reimplantation of a Trepine Button of Bone, *Boston M. & S. J.* 118: 313, 1888. Guerin, M. A.: Reimplantation des rondelles osseuses après la trepanation, *Bull. Acad. de méd.* 20: 604, 1888.
12. Macewen, W.: On the Surgery of the Brain and Spinal Cord, *M. News, Philadelphia* 53: 169, 1888. Keen, W. W.: Filling Defects of the Skull by Bone Chips from the Outer Table of the Neighboring Bone, *Ann. Surg.* 42: 296, 1905.
13. Grant, F. C., and Norcross, N. C.: Repair of Cranial Defects by Cranioplasty, *Ann. Surg.* 110: 488, 1939.

14. Booth, J. A., and Curtis, B. F.: Report of a Case of Tumor of the Left Frontal Lobe, *Ann. Surg.* 17: 127, 1899.

15. Venable, C.: Osteosynthesis in the Presence of Metal: Studies on Electrolysis, *South. M. J.* 31: 501, 1938.

16. Mixer, W. J., in discussion on Grant and Norcross.¹³

17. Pringle, J. H.: Remarks on the Closure of Gaps in the Skull, *Brit. M. J.* 1: 246, 1906.

18. Henschen, cited by Drevermann, P.: Ueber den Ersatz von Dura- und Schädeldefekten, *Beitr. z. klin. Chir.* 127: 674, 1922.

Naffziger¹⁹ said that he was disappointed in having the graft absorbed in a larger percentage of cases than Grant and Norcross had had. He also brought up the objection to extensive removal of bone from the skull with a chisel because of the necessity for the use of the hammer and the jarring that it produces. This oper-

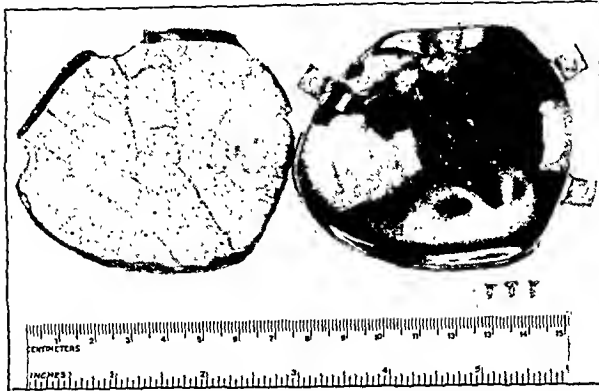


Fig. 2 (case 1).—Inner surface of flap and plate. The surface of the vitallium plate is polished. There is no need to polish either surface.

ation requires further incisions of the scalp, the removal of more of the skull and other procedures which mean a prolonged, complicated operation. Split ribs can be used with good results in larger defects.¹³ Again, there are secondary incisions with a prolonged operative procedure. Absorption may take place. Great care has to be taken by the patient to protect his head for some months after operation.

I attended the meeting of the Texas Surgical Society when Drs. Venable and Stuck presented their original paper on the use of vitallium in bone-plating operations. Since that time these authors have published a number of papers on the use of vitallium in bone surgery. They have shown that corrosion of metal plates and screws is due to electrolysis occurring between the metals used and the tissues of the body. After using all sorts of pure metals as well as alloys of metals, they came to the following conclusions:²⁰ There are two electrically neutral metals which can be used *in vivo*. The one metal is silver 96 per cent chemically pure and the other is an alloy of cobalt, chromium and nickel (vitallium). Silver of this purity is not adaptable as far as rigidity and tensile strength are concerned. Vitallium has tremendous tensile strength and can be used effectively. The transplantation of vitallium into the body over bony surfaces and into bony surfaces produces no reaction of the bodily tissue, with the result that there is no

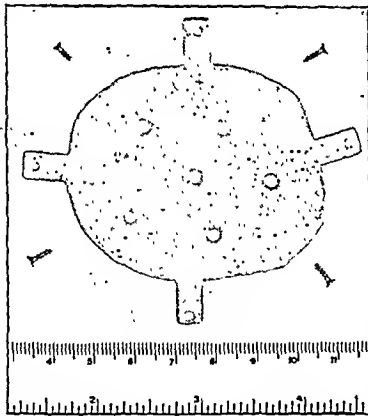


Fig. 3 (case 2).—Perforations, longer lugs and flat-headed screws in the vitallium plate. As this view is of the inner surface, the countersunk surface of the lugs does not show.

corrosion and no atrophy of the surrounding tissue. Hopkins and Zuck²¹ reported the first use of a vitallium cup (a large surface-covering piece of the alloy) in arthroplasty of the hip with apparently the same good results as Venable and Stuck had had with their plates and screws.

I thought that if there was no reaction to vitallium, such as these authors described, then it would be possible to use this metal to repair defects of cranial bone and that this metal would satisfy all the theoretical requirements of an inserted skull plate. It would be further advantageous over the autogenic bone grafts in that the operative difficulties and the time would be tremendously reduced. Once the vitallium plate had been inserted and the wound had healed over there would be no need of protection as far as the operative area was concerned. A vitallium plate could be inserted into the defect and then screwed tightly to the surrounding skull by the use of screws made of the same metal. One question arose, however, and that was whether or not vitallium could be transplanted into the body under a superficial surface such as the scalp. In all other bone-plating operations the plates have been covered over by muscle, and in Hopkins' case, in

which a large piece of metal was used, the vitallium hip cup was deep as far as the surface of the body was concerned. It seems to me that if vitallium is inert in the body it would not make much difference how superficial it is to the surface of the body as long as it is covered by bodily tissue.

The first vitallium plate used was cast from an impression of the piece of skull which had been removed (figs. 1 and 2). This presented no difficulties as far as the size of the plate to be used was concerned. The vitallium plates used in cases 2 and 3 had to be designed for contour because there was no original section of the skull from which to cast the plates. The first plate was approximately $\frac{3}{16}$ inch (0.5 cm.) thick, and the lugs were about $\frac{1}{4}$ inch (0.6 cm.) long. It will be noticed in the illustrations that the lugs have countersunk openings and the screws are flat headed so as to prevent any projection over the contour of the plate itself. I failed to remember that some atrophy occurs around the defect of the skull after the original operation, so that the lugs were barely long enough to cover the surrounding bone in order for me to insert the vitallium screws. The second plate (fig. 3) had longer lugs, and there was no difficulty about this part of the second operation. The plate was much thinner, about $\frac{1}{8}$ inch (0.3 cm.) in thickness. Furthermore, I had some holes drilled through the plate itself. These holes were to allow the escape of fluids beneath the plate which, however, I think is negligible because the plate never fits snugly at the periphery. In

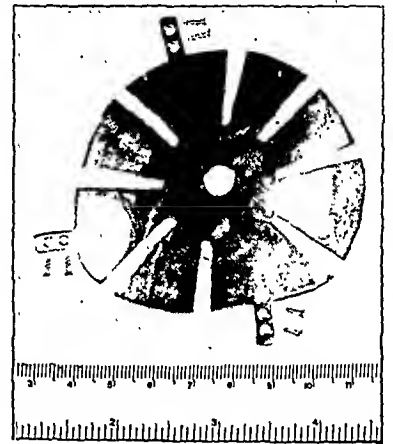


Fig. 4 (case 3).—Slots in vitallium plate.

19. Naffziger, H. C., in discussion on Grant and Norcross.¹²
20. Venable, C. S., and Stuck, W. G.: Electrolysis Controlling Factor in the Use of Metals in Treating Fractures, *J. A. M. A.* 111: 1349 (Oct. 8) 1938.

21. Hopkins, H. H., and Zuck, F. N.: Arthroplasty Use of Vitallium Cup, *M. Bull. Vet. Admin.* 15: 1, 1938.

is no need for the plate to fit snugly except for the lugs to cover the surrounding bone. I thought of putting a silk suture or two into the dura, passing the sutures through the openings and suturing it to the overlying galea, to eradicate dead space beneath the plate. How-

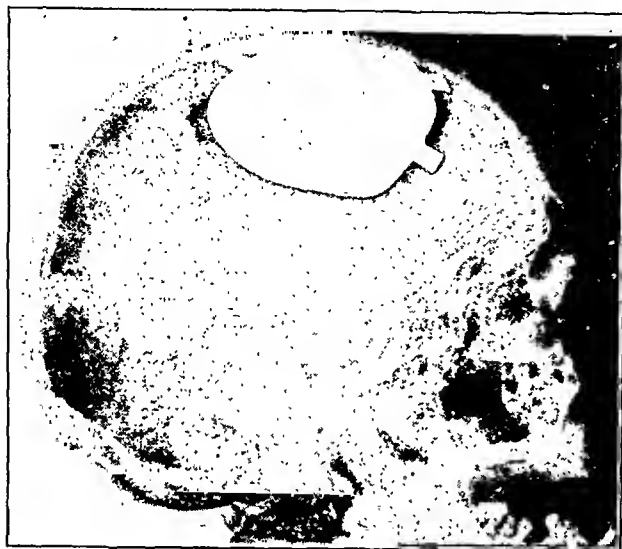


Fig. 5 (case 1).—Vitallium plate in place.

ever, I did not need to use the silk sutures because the dead space was eliminated by the intracranial contents pushing the dura flush against the inside of the plate.

At this time it occurred to me that there was a possibility of a further use of perforations in these plates. Since vitallium is inert there is no reason why granulation tissue should not grow through these openings and attach the under surfaces of body tissue to those of the top surface covering the plate, holding it more securely against the surrounding tissue. From my experience in inserting these plates there have arisen certain possibilities which I think could be followed, as



Fig. 6 (case 1).—Defect of the skull.

far as the construction of the plate and the ease of its insertion are concerned.

Vitallium is extremely rigid and has to be cast. The third plate was of 26 gage thickness, and a number of slots were cut into it from the periphery toward the center (fig. 4), allowing the plate to be bent at the time

of operation to make it fit more completely the contour of the contiguous skull. However, the slots should be $\frac{1}{16}$ inch (0.16 cm.) wide instead of $\frac{1}{8}$ to $\frac{5}{32}$ inch (0.3 to 0.4 cm.) because the brain tends to push up into the slots. The second skull plate was made from a pattern cut of the bony defect at the time of the original operation. One may not be so fortunate in having 2 such cases as I have described but may have to make a plate for a defect of the skull without a pattern for size. I have thought of using this technic in such cases: A roentgenogram is made of the patient's skull. A piece of lead is then strapped with adhesive tape on the shaven scalp over the defect. Another roentgenogram is taken to determine how close a fit has been made. One may be able to mold the plate so that its contour will be that of the skull in this region. However, if this is not possible one can use the molding wax used in dentistry to get the contiguous contour of the surrounding skull and then build in the proper con-



Fig. 7 (case 1).—Patient under anesthesia just before operation. The outline of the defect of the skull can be seen.

tour that one thinks the defect should have. In my second and third cases I used strips of cardboard and cut the contours out from the edge of the cardboard, placing the cut edge against the skull until my eye told me that the contour was apparently the correct one.

Vitallium can be cut with a high speed grinding apparatus, and one can easily get close to the proper shape and contour before the operation. Then at the operation when the defect is completely exposed the metal is marked off where it does not fit, taken off the table, cut off with the grinder, resterilized and tried again. It probably would not take more than twenty minutes to do this. Of course, one can remove some of the bone with a rongeur to make the plate fit.

When I inserted the first plate I did a great deal more than was needed as far as operating was concerned. This was probably due to the fact that I was accustomed to cleaning off the surrounding edge of bone from all adjacent soft tissue in preparation for the use of autogenic bone grafts. This is only extra work and serves no useful purpose. When I inserted the second

and third plates, I merely cut the flap of the scalp free from the dura, put the plates in position over the defect, adjusted the lugs over the surface of the surrounding bone and screwed them fast. The operative time was barely more than an hour, and there was little bleeding.

There is no need to make a groove in the bone for the lugs to fit. They are screwed to the surface of the surrounding skull and project up approximately $\frac{1}{16}$ inch (0.16 cm.) above the contour of the bony skull. This does not interfere with the subsequent healing, and one cannot feel the projection of these lugs through the scalp. A $\frac{1}{80}$ inch (0.05 cm.) drill is used to make a hole in the skull into which the screw is placed.

After the operation there apparently was some fluid present, and this was aspirated on about the third or fourth day. In each case there was no need for another aspiration. The flap of the scalp at the end of the third day was fairly tight over the surface of the vitallium

considered rupture of an aneurysm as the most likely cause. After a few days he became comatose, the pulse rate dropped to 42, the respiratory rate slowed to 6, cyanosis appeared and he became moribund. I did a frontal craniotomy on the left side in the hope of saving him (fig. 6). The hemorrhage was



Fig. 8 (case 1).—Appearance of patient nine days after operation. Note normal contour of treated area.

plate. At the end of the sixth day the flap was tight against the plate, and the motion in the flap was less than the motion in the scalp over the portion of the skull not operated on.

The vitallium skull plate has been in place now for two years (fig. 5). A roentgen check-up at the end of eleven months showed no increase in the size of the bony defect and no atrophy of the bone around the lugs or screws. The second plate has been in place one year and the third for six months. Roentgenograms taken at the end of three months showed no atrophy in the second and third cases. One cannot tell by observation or by palpation that there is anything but the patient's own skull beneath the operative scar.

REPORT OF CASES

CASE 1.—C. B., a right-handed man aged 28, had signs and symptoms of intercranial bleeding. A sudden intracranial hemorrhage occurred, causing hemiplegia on the right side. I



Fig. 9 (case 2).—Defect of the skull.

within the brain, which was under great pressure. The operation was started without the need of an anesthesia. As soon as the dura was opened, the pressure was relieved, and local



Fig. 10 (case 2).—Appearance of head four months after the vitallium plate was inserted.

anesthesia was needed to complete the procedure. The flap of bone could not be reinserted because of the bulging brain. At the end of ten months the patient was walking and had fair use of his arm. He stumbled and struck his head near the defect (fig. 7) several times. The flap of bone (fig. 1)

had been saved for the purpose of making a vitallium plate. He was discharged ten days after operation (fig. 8) and has had no trouble with the vitallium plate, no fluid about it, no headaches, no tenderness of the scalp or any other symptoms. In fact, he has had several blows over the plate without any symptoms.

CASE 2.—A. Z., a right-handed man aged 26, had osteomyelitis of the left parietal area of the skull. He had sustained an injury by a piece of metal striking his head after a drop of three stories while he was working on an elevator shaft in a construction job. The osteomyelitic area was removed, and he made an uneventful recovery. He was in constant fear of further injury (fig. 9) and was afraid to go on active elevator construction work. It was a compensation case and meant that a large monetary reserve had to be set aside by the company in the event that some further aggravating factor would occur. Some seven months after the wound had healed a vitallium plate was inserted (fig. 10). The patient was discharged seven days after operation and went back to active construction work two weeks later. His fears have vanished. Five weeks after operation the hood of his car fell off and struck him across the plate. No symptoms developed other than a tenderness of the scalp that cleared up in a few days. A roentgen check-up three months later showed no atrophy about the lugs or screws.

CASE 3.—M. D., a man, had a subdural hemorrhage and later had cerebral edema and pressure from intracerebral hemorrhage, so that a flap of bone as well as more of the skull had to be removed to decompress his brain. This gave him a large anterior medial defect of the skull. I used a slotted plate in this instance and was able to bend the wings of the plate between the slots to fit the exact contour of the skull. Roentgenograms of the patient's skull after four months showed no atrophy about the screws.

CONCLUSIONS

1. Operations on the skull using metal plates have been discarded because of the reaction as to a foreign body or the lack of rigidity of the plate.
2. Autogenic bone grafts have given the best results up to the present time, although they require secondary incision and complicated operative procedures and may be absorbed.
3. Vitallium is neutral in vivo and can be used for repairing defects of the skull. It is rigid, stronger than bone, noncorrosive and inexpensive and requires a much less complicated cranioplastic operation than any in use at the present time. The patient can be back at work on heavy duty within three weeks after operation.
4. A vitallium plate makes the strongest and least complicated plastic repair of the skull known.

ADDENDUM

Since this paper was sent in for publication, another plate of 28 gage thickness has been inserted. The slots were less than $\frac{1}{16}$ inch wide. In making out the pattern, I indicated where the slots should be cut. This made it possible to bend the plate at the operating room table with a pair of pliers so as to give a perfect fit so far as contour is concerned. Making the plate this thin and arranging the slots obviates any trouble whatever in fitting this plate. The Austenal Laboratories were able to deliver this plate within two days.

The third patient developed a nasopharyngeal carcinoma and died from metastasis eight months after the plate had been inserted. We were fortunate in being able to get a postmortem examination and Dr. Ivan Gaspar, the pathologist, was able to cut the vitallium skull plate out with a half inch margin of bone without disturbing the plate. The condition of the plate was the same as when it was inserted. The high luster was unchanged. The screws were firmly embedded in the

bone. The soft tissue had grown about the plate up through the slots and small openings and had completely incorporated the plate in a soft fibrous covering. The tissue over the plate was firmly attached and peeled off the plate much as gelatin would peel off a glass surface. The dura beneath the plate had regenerated itself where the operation had left a defect at the time of the original craniotomies. There was absolutely no reaction and this autopsy proved my theory that the tissue would grow up through and around the openings and slots of these vitallium plates, obliterating all dead space and tending to hold the plate more securely in position as if it were part of the tissue itself.

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SPONTANEOUS HYPOGLYCEMIA IN "SMOKE" DRINKERS

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During the past few years we have had an opportunity to observe an unusual form of spontaneous hypoglycemia which, as far as we are aware, has not been previously reported. The patients concerned have all been chronically addicted to alcohol and have been drinkers of denatured alcohol in a form known locally as "smoke." This so-called smoke has been prepared by the addition of a variety of denatured alcohols (varnish and paint removers, antifreeze, "canned heat") to water; the milky or "smoky" appearance of the resultant mixture has been the basis for its name. Samples of typical denatured alcohols used have always given strongly positive tests for methyl alcohol. Not one of the patients, however, has complained of diminution of vision.

Although we have gathered little information concerning the exact nature and cause of this hypoglycemic reaction, we are reporting our clinical observations on 6 patients in the hope that other cases may be recognized elsewhere and further studies made on the nature of this disturbance in carbohydrate metabolism.

REPORT OF CASES

CASE 1.—A. W., an unemployed Negro aged 62, admitted to the Johns Hopkins Hospital on March 19, 1934, had been a heavy drinker for years, consuming at least two or three glasses of whisky a day. Three weeks before admission a chest cold developed with a cough which persisted until two days prior to admission, when he began to feel better. Because of his cold he drank more heavily than ever. The day of admission he became comatose and was brought to the hospital.

The temperature was 96 F. (rectal), pulse rate 80, respiratory rate 28 and blood pressure 200 systolic and 110 diastolic. He was well developed and fairly well nourished and was in deep coma. The skin was cool and dry. There were rhonchi over the right anterior part of the chest. The heart was normal in size and there was a long blowing systolic murmur at the apex. The abdomen was soft, rounded and moderately tympanitic. The liver was not felt, although liver dullness was percussed several centimeters below the costal margin. The spleen was not palpable.

The neurologic examination was of chief interest. There was conjugate deviation of the eyes to the left. The pupils

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were equal and reacted to light. The optic disks were clearly demarcated. The jaws were tightly clinched, but the neck was not stiff. All four extremities were held in such rigid extension that passive flexion was almost impossible. The Kernig sign could not be elicited because of the rigidity of the legs. The Babinski reflex was questionable. The Hoffmann sign was negative. Normally active deep reflexes were obtained throughout, whereas the abdominal and cremasteric reflexes were not present. Blood examination revealed hemoglobin 14.2 Gm., erythrocytes 4.36 million, leukocytes 12,000 with polymorphonuclear neutrophils 98 per cent and lymphocytes 2 per cent. A trace of albumin was present in the urine. From 5 to 6 leukocytes and 2 to 3 granular and hyaline casts per high power field were seen in the urinary sediment. The Wassermann reaction was negative.

The first clinical impression was that the patient had some form of cerebral accident superimposed on a state of alcoholic intoxication.

Blood sugar, nonprotein nitrogen and carbon dioxide combining power determinations were made to rule out the possibility of diabetic coma and uremia. Much to our amazement the blood sugar was found to be 15 mg. per hundred cubic centimeters. This reading was checked on the same sample of blood. The carbon dioxide combining power of the serum was 40.9 volumes per cent and the blood nonprotein nitrogen 36 mg. per hundred cubic centimeters.

About three and a half hours after admission the patient began to show signs of improvement, although he was given no specific therapy. He moved his arms, attempted to remove the mouth gag, and coughed. Two hours later he had returned completely to normal. The spasticity had entirely disappeared. The abdominal and cremasteric reflexes had returned. The Babinski reflex was plantar. The temperature had risen to 101.6 F. There were fine rales near the medial portion of the right scapula. The blood sugar had risen to 105 mg. per hundred cubic centimeters.

From this time on the patient's course was uneventful except for the development of a low grade bronchopneumonia, probably related to aspiration during the comatose state. Two days after admission the blood pressure was 152 systolic and 72 diastolic and two days later 116 systolic and 66 diastolic. The blood pressure remained normal until the time of discharge.

The dextrose tolerance curve (100 Gm. of dextrose by mouth) after the patient had recovered gave the following blood sugar levels: 85 (fasting), 115, 150, 165, 160, 75, 55, 82 mg. per hundred cubic centimeters in one-half, one, two, three, four, five and six hours respectively. The insulin tolerance test (2 units of insulin intravenously) gave a blood sugar of 70 (fasting), 60, 48, 60, 64, 80 and 82 mg. per hundred cubic centimeters in one quarter, one and a half, two, two and a half, three and four hours respectively.

CASE 2.—N. W., a Negro woman aged 28, was brought to the Johns Hopkins Hospital unconscious on Aug. 11, 1935. During the month prior to admission she had consumed 2 or 3 pints of whisky each week. There was no history of previous attacks of unconsciousness.

When first seen, she did not respond to painful stimuli. The pulse rate was 89, respiratory rate 22. There was no record of the temperature. The blood pressure was 120 systolic and 85 diastolic. The respirations were regular and deep. The pupils were contracted but reacted to light. There was spasm of the muscles of mastication and an occasional flexor spasm of the arms and hands. The neck was not stiff. The Babinski reflex was present on both sides. The remainder of the examination was negative.

Laboratory examinations revealed a blood sugar level of 20 mg. per hundred cubic centimeters, hemoglobin 12.4 Gm., erythrocytes 3.88 million, leukocytes 22,000 with a normal differential and a sedimentation rate of 22 mm. an hour. The Wassermann reaction was negative. Lumbar puncture containing 15 cc. of clear colorless fluid and 10 cells was obtained, but the type was not recorded. The Pandy reaction was negative. Examination of the urine revealed a trace of albumin, 4+ acetone, and no diacetic acid.

Specific therapy was not given. The return to normal was slow, and two days elapsed before she fully regained consciousness.

CASE 3.—O. L., a white man aged 68, a machinist, was brought to the Johns Hopkins Hospital in coma on Dec. 19, 1935. Two days before admission he drank two large glasses of rye whisky and followed this with an undetermined quantity of "smoke." The next day he was found unconscious.

On admission the temperature was 97.6 F., pulse rate 94, respiratory rate 12 and blood pressure 80 systolic and 40 diastolic. He was in deep coma and the breath smelled of denatured alcohol. The respirations were slow and stertorous. There was moderate cyanosis of the mucous membranes. The pupils were small and reacted sluggishly to light. There was conjugate deviation of the eyes to both sides. The jaws were so tightly clenched that the mouth could not be forced open. There was extensor rigidity of the extremities. There was contraction of the adductor muscles on stimulation of the sole of the left foot. The Babinski reflex was absent. There was no clonus. Cervical rigidity was not noted. The abdominal reflexes were absent.

The urine contained 2+ albumin and an occasional red blood cell. Hemoglobin was 100 per cent, the erythrocytes numbered 5.1 million and the leukocytes 10,500 with a normal differential count. The blood sugar was 33 mg. per hundred cubic centimeters, the nonprotein nitrogen 46 mg. per hundred cubic centimeters and the carbon dioxide combining power 37.2 volumes per cent. Total proteins were 7.96 Gm. per hundred cubic centimeters with an albumin-globulin ratio of 57:43.

The patient was given 250 cc. of warm coffee by rectum and a hypodermic injection of nikethamide and caffeine with sodium benzoate. Following this treatment the blood pressure rose to 130 systolic and 80 diastolic; however, the coma persisted. When it was found that the blood sugar was 33 mg. per hundred cubic centimeters an intravenous injection of 40 cc. of 50 per cent dextrose was given. There was a dramatic response to this treatment. He regained consciousness and began to talk almost immediately. The patient was discharged from the hospital the following day.

CASE 4.—W. B., a Negro laborer aged 35, admitted to the Johns Hopkins Hospital April 6, 1937, was a heavy drinker and went on sprees two or three times a week, but in spite of this he stated that he had a good food intake. Five weeks before admission a penile lesion developed. On the morning of the day of admission he drank some corn liquor and followed this with beer, more whisky and "smoke." He became unconscious at noon and was brought to the accident room.

On admission the temperature was 96 F., pulse rate 80, respiratory rate 20 and blood pressure 170 systolic and 105 diastolic. He was in deep coma and there was Cheyne-Stokes breathing. There were transient attacks of trismus. The extremities were cold. The deep reflexes were hyperactive. The Babinski and Hoffmann reflexes were present on the right, and there was moderate spasticity of the extremities. The neck was not stiff. A granulomatous lesion of the skin was present on the right leg. The heart, lungs and abdomen were normal.

Hypoglycemia due to "smoke" was suspected clinically. The blood sugar was 43 mg. per hundred cubic centimeters and the carbon dioxide combining power 48.5 volumes per cent. Erythrocytes numbered 5.7 million with 97 per cent hemoglobin. The sedimentation rate was 5 mm. an hour and the volume packed red blood cells was 52. The leukocyte count was 10,000 with a normal differential. The Wassermann reaction was negative.

An intravenous injection of 40 cc. of 50 per cent dextrose was followed almost immediately by a dramatic return of consciousness.

Two days later various liver function studies were made. These tests failed to reveal any evidence of disturbed liver function. Bromsulphalein showed less than 5 per cent retention. The galactose tolerance test, 0.9 Gm. excretion in three hours. The levulose tolerance test was normal. The dextrose tolerance test (1.7 Gm. of dextrose by mouth per kilogram body weight), 77 (fasting), 96, 115, 95 and 75 mg. per cubic centimeters at one-half, one, two and three hour intervals.

CASE 5.—A Negro aged 35 who came to the accident room of the Johns Hopkins Hospital on Aug. 14, 1938, had two months before drunk a half pint of gin. The next morning he felt weak, perspired profusely, frothed at the mouth, bit his tongue, was unable to speak but did not lose consciousness. He managed to eat a sour pickle and, following this, began to regain his strength. After eating more food he felt stronger, and soon the "spell" passed off.

On the day before admission he did not eat breakfast. At 2 p. m. he had a fried crab and 2 spoons of corn. At about 4 o'clock he drank some corn whisky and soon after this ate two apples. He had no supper, but in the evening he ate two sticks of candy. At 2 a. m. he drank three glasses of beer and, a little later, three quarters of a pint of "white corn whisky." At about 2 o'clock in the afternoon he walked into the accident room and complained of weakness. He asked for a salt tablet and in a few moments became faint, began to froth at the mouth and lapsed into a state of unconsciousness. His temperature was 95.4 F., respiratory rate 20 and blood pressure 120 systolic and 75 diastolic. The pulse was not recorded. The breath smelled of alcohol. The skin was cold and moist. The pupils were small and reacted sluggishly. The jaws were clenched tightly and could not be opened. The neck was not stiff. All deep reflexes were hypoactive. There was no spasticity of the extremities. There was urinary incontinence. The remainder of the examination gave negative results. Soon after admission to the ward, the perspiration became more profuse. Conjugate deviation of the eyes to the left developed, the left jerk became hyperactive and there was a definite Babinski reflex present on the left side. The liver edge was palpable 2 cm. below the costal margin.

The blood sugar was 38 mg. per hundred cubic centimeters. Carbon dioxide combining power was 32 volumes per cent. The hematocrit reading was 48 and the blood leukocyte count was 20,800. Examination of the urine revealed 1+ albumin, 2+ acetone and no diacetic acid.

There was prompt recovery following the intravenous injection of 50 cc. of 50 per cent dextrose. The temperature immediately rose to 99.4 F. The following morning the fasting blood sugar level was 85 mg. per hundred cubic centimeters. A dextrose tolerance test (dextrose by mouth) at this time gave the following results: 113, 104, 98 and 82 mg. per hundred cubic centimeters at one-half, one, two and three hours.

CASE 6.—I. B., a Negro laborer aged 41, chronically addicted to alcohol, has had two observed hypoglycemic attacks following the drinking of "smoke." The first attack occurred in June 1939, at which time he was brought to the accident room of the Johns Hopkins Hospital in coma. The pulse rate was 50, respiratory rate 16 and blood pressure 130 systolic and 80 diastolic. There was a strong alcoholic odor to the breath. The extremities were held in rigid extension but the neck was not stiff. He was perspiring profusely. Hypoglycemia was suspected in view of previous experience with this syndrome. Blood was drawn for sugar determination, and the patient was immediately treated with an intravenous injection of 500 cc. of physiologic solution of sodium chloride and 500 cc. of 5 per cent dextrose. This was followed by 250 cc. of 20 per cent dextrose. The patient responded dramatically to the treatment and soon was mentally clear and able to talk. The blood sugar level in the sample taken before the intravenous therapy was 21 mg. per hundred cubic centimeters.

The patient was admitted to the Johns Hopkins Hospital on Dec. 28, 1939 because of severe alcoholic peripheral neuritis. Stocking and glove anesthesia, foot drop and bilateral optic neuritis were noted. He was found to have macrocytic anemia. The erythrocyte count was 3.51 million, the hemoglobin content 11.6 Gm. and the mean corpuscular volume 98 cubic microns. A dextrose tolerance test was performed in view of the previous attack of hypoglycemia; 97.5 Gm. of dextrose was given by mouth. Blood sugar levels were as follows: 79 (fasting), 115, 90, 93, 40, 66 and 67 mg. per hundred cubic centimeters at one-half, one, two, three, four and five hours respectively. The Wassermann reaction was negative.

In May 1940 he was readmitted to the hospital in his second observed attack of hypoglycemia following the drinking of "smoke." The breath was strongly alcoholic. The lips and tongue were cyanotic. The respirations were rapid (47 per minute), labored and noisy. The blood pressure was 100 systolic and 80 diastolic. The pupils reacted sluggishly to light, and the fundi were normal. The neck was not stiff. The deep reflexes were sluggish on the right but normal on the left except for the absence of the left ankle jerk. The Babinski reflex was plantar. It was of interest that the extensor rigidity of the extremities, noted at the time of the first attack of hypoglycemia, was not present on this occasion. As soon as blood was drawn for sugar determination 15 cc. of 50 per cent dextrose was administered intravenously. A subcutaneous injection of 0.4 Gm. of caffeine with sodium benzoate was also given. He responded satisfactorily to this treatment and was soon able to talk. The blood sugar prior to treatment was later found to be 41 mg. per hundred cubic centimeters. On the following day the fasting blood sugar was 88 mg. per hundred cubic centimeters and the nonprotein nitrogen was 44 mg. The carbon dioxide combining power was 57.9 volumes per cent and the chlorides 92.6 milliequivalents per liter. Bromsulphalein showed 20 per cent retention one-half hour after injection. The galactose tolerance test gave negative results. An intravenous dextrose tolerance test gave blood sugar levels of 95 (fasting), 178, 124, 94, 81, 85 and 89 mg. per hundred cubic centimeters at one-half, one, two, three, four and five hours respectively. An epinephrine tolerance test was performed with 0.4 mg. of epinephrine given intravenously; thirty seconds after the injection the patient began to sweat profusely and became very pale, and neither the blood pressure nor the pulse rate could be obtained. The extremities were held in rigid extension. These symptoms lasted for two minutes. Blood sugar levels of 104, 96, 90 and 91 mg. per hundred cubic centimeters were obtained at one-half, one, two and three hours respectively. Unfortunately, no blood sugar determination was made during the period of acute symptoms following the injection of epinephrine. Anemia was not observed during this admission, although the macrocytosis had become more severe. The mean corpuscular volume was now 102 cubic microns.

COMMENT

All these patients undoubtedly had been drinking some form of denatured alcohol. The odor of the breath in each instance was of the same highly offensive, sickening, alcoholic character and unlike the odor of the breath when ordinary alcoholic liquors have been consumed. Three of the six patients finally admitted that they had been drinking "smoke" prior to the onset of the acute symptoms. Drinkers of "smoke" usually deny this practice to avoid complications with the police. There are several areas in East Baltimore, known to the police, where there are groups of "smoke" drinkers. Four different samples of denatured alcohol have been obtained from stores in one of these areas. The samples were obtained from large metal drums which were labeled "Denatured Alcohol Solvent." One storekeeper admitted knowing that the denatured alcohol which he sold was being used for drinking purposes. The other three storekeepers denied knowledge of any use for this denatured alcohol other than as a solvent.

The four different samples of denatured alcohol were analyzed by the Department of Internal Revenue in Washington, D. C. The report of this analysis, forwarded to us by the deputy commissioner, Mr. Stewart Berkshire, is given in table 1.

The neurologic manifestations were prominent, and it is probable that many patients previously seen with this type of hypoglycemia have been thought to have a cerebral accident. The first patient in this series was thought to have a subarachnoid hemorrhage. It was only to rule out other causes of coma that a blood sugar determination was made and the hypoglycemia recog-

nized. Once this entity was discovered, the subsequent cases were for the most part diagnosed before the blood sugar determination was made. Bizarre neurologic signs such as extensor rigidity of the extremities, unequal deep reflexes, Babinski reflexes, clonus, trismus, conjugate deviation of the eyes and occasional spasmodic twitching of the extremities have been observed. Hypothermia has been uniformly present in the cases in which the temperature was recorded. The blood pressure was elevated in two instances during the attack and returned to normal following recovery. In the remaining four cases it was either normal or subnormal. In no instance was the blood pressure very low or unobtainable. The spinal fluid was normal in the one case in which it was examined. The blood leukocyte count was generally moderately elevated. Although in general there was a reduction of the carbon dioxide combining power, there was no instance of severe acidosis. The lowest blood sugar in the group was 15 mg. per hundred cubic centimeters and the highest 43 mg., the average being 30 mg.

The last four of the six patients were treated intravenously with hypertonic dextrose solution, which resulted in a rapid and dramatic return to normal in each instance.

All the patients came from a low economic level and had undoubtedly been on very poor diets for a considerable period of time. In addition, most of them had eaten almost nothing for the period immediately preceding their attack of hypoglycemia. We have not found evidence of hypoglycemia in the average case of alcoholic intoxication seen in the accident room. The studies performed on hypoglycemia due to "smoke" have revealed evidence of depressed function of the liver in only one instance, and this was not appreciable. It is to be noted, however, that the tests for hepatic function were made following recovery from the acute comatose state.

TABLE 1.—Report on Four Samples of Denatured Alcohol

Sample	Per Cent of Ethyl Alcohol by Volume	Per Cent of Methyl Alcohol	Per Cent of Gasoline	Ethyl Acetate, Gm. per 100 Cc.
A.....	86.75	4.39	0.8	3.26
B.....	86.78	4.37	0.7	3.35
C.....	86.43	4.53	0.7	3.54
D.....	86.21	4.32	0.8	3.67

The examination of these samples shows they are proprietary solvents manufactured in accordance with the following formula:

Specially denatured alcohol formula no. 1	100 gallons
Ethyl acetate	5 gallons
Gasoline	1 gallon

Specially denatured alcohol formula no. 1 is prepared in denaturing plants by adding 5 gallons of denaturing grade methyl alcohol to each 100 gallons of 190 proof ethyl alcohol. Specially denatured alcohol formula no. 1 may be obtained only under a permit for manufacturing purposes. Proprietary solvents are manufactured by permittees in accordance with the above formula and are intended for sale and use for solvent purposes. They are sold under trade names and under the regulations pertaining to the production, use and denaturation of ethyl alcohol may not be branded, labeled or sold as denatured alcohol.

Dextrose tolerance curves were determined in several of these cases, but the data are insufficient for any definite conclusions. In case 6 a flat curve was obtained when an oral test was employed. This might indicate either poor intestinal absorption or increased utilization

of dextrose. Further studies are in progress with an intravenous dextrose tolerance test which, it is hoped, will throw more light on the nature of this abnormality.

An attempt was made to reproduce this clinical picture in dogs. Two animals were starved for forty-eight hours and then kept in a state of acute alcoholic

TABLE 2.—Summary of Clinical Features and Laboratory Results

Case	Temperature, F.	Abnormal Neurologic Manifestations *	Blood Sugar, Mg. per 100 Cc.	Carbon Dioxide Combining Power, Volumes per Cent	Blood Pressure, Mm. of Mercury
1	96	++++	15	40.9	200/110
2	Not recorded	++++	20	Not done	120/ 85
3	97.6	++++	33	37.2	80/ 45
4	96	++++	43	48.5	170/105
5	95.4	++++	38	32.0	120/ 75
6 A †	Not recorded	++++	21	Not done	150/ 85
B ‡	Not recorded	+	41	57.9	100/ 85

* These included: conjugate deviation of the eyes, extensor rigidity of the extremities, positive Babinski reflex, hyperaetivity or inequality of the deep reflexes, and sluggish reaction of the pupils to light.

† First attack.

‡ Second attack.

intoxication for a period of twenty-four hours by the administration of "smoke" through a stomach tube. The material used was the same as that consumed by patient 4 just prior to his attack of hypoglycemia. In neither of the animals was there any appreciable change in the blood sugar curve during the period of coma, which lasted for several hours.

It is clear that the denatured alcohol has been responsible for the development of hypoglycemia in the patients. The knowledge of the manner in which the poison has acted to produce the change in carbohydrate metabolism has remained obscure. There has been no evidence of either widespread damage to the liver or hyperinsulinism. The reduction of hepatic glycogen by starvation, associated with continued drinking, may have played a role; however, starvation alone has not been known to produce severe hypoglycemia in such a short period. It is possible that the poisonous substance might have caused increased utilization of carbohydrate with resulting hypoglycemia under the particular circumstance of depleted glycogen supply. Another possible explanation, and perhaps the most likely one, is that the poisonous substance temporarily inhibited glycogenesis, interrupting the normal conversion of protein to carbohydrate. The transient character of the hypoglycemia has favored this hypothesis. The first two patients recovered spontaneously without specific therapy, and the remaining four patients responded rapidly to treatment with intravenous hypertonic dextrose solution.

CONCLUSION

1. There is a clinical picture of hypoglycemia associated with alcoholic intoxication due to "smoke" (a form of denatured alcohol).

2. The six typical cases reported here presented average blood sugar levels in the acute attack of 30 mg. per hundred cubic centimeters.

3. The most important clinical finding, when present, has been extensor rigidity of the extremities. Bizarre neurologic manifestations of various types were present.

4. In only 1 of the 6 cases was there any demonstrable evidence of damage to the liver.

5. The attempt to produce hypoglycemia in dogs by feeding this alcoholic mixture has failed.

6. Treatment with hypertonic dextrose solution intravenously has resulted in dramatic and rapid recovery.

ISLET CELL TUMORS OF THE
PANCREAS

REPORT OF CASE

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Since the report in 1929 by Howland and his associates¹ of a case of dysinsulinism due to an adenoma of the pancreas in which operation was successful, the number of cases reported has increased rapidly. In a recent article Frantz² listed 96 cases of tumors of the islet cells found at operation or at autopsy.

It is difficult to determine the exact number of tumors of the islet cells reported to date, since the same cases are cited two and three times by various authors. From a careful investigation of the literature we have gathered 71 cases (table 1) of tumors of the islets of Langerhans in which the diagnosis was made preoperatively and confirmed at operation. These include 5 cases of carcinoma of the islets of Langerhans with gross metastases.

Of the 71 patients 53 were completely relieved of symptoms postoperatively, 12 died at operation or shortly thereafter and 1 was not relieved despite the removal of an adenoma.³

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In 1924 Harris⁴ first hypothesized on the possibility of a functional type of hypoglycemia due to hyperinsulinism. He mentioned the possibility of the hypoglycemia being associated with dysfunction of the thyroid, the pituitary and the other glands of internal secretion. That hypoglycemia and hyperinsulinism were not associated with adenoma of the islets of Langerhans was shown by the fact that Warren,⁵ in 1926 in a report on adenomas of the islets of Langerhans, stated that they probably never give rise to trouble during life and have no clinical significance. It was not until the following year that the report by Wilder and his associates⁶ of a malignant tumor of the islets of Langerhans with metastases to the liver first drew attention to tumors of the islet cells as a cause of hypoglycemia. After this report, Thalheimer and Murphy⁷ in 1928 reported a case involving clinical symptoms of hypoglycemia and low blood sugar levels in which at autopsy a malignant tumor of the pancreas was seen. Later that year the Finneys⁸ attempted surgical intervention, in the hope of finding a resectable adenoma, on a patient with clinical symptoms of hypoglycemia and low blood sugar values.

Early in 1929 McClenahan and Norris⁹ reported the first case of a single benign tumor in the islets of Langerhans which was associated with hypoglycemia, suspected by antemortem studies on the blood and proved at autopsy. They expressed the opinion that hypertrophy and adenomas of the islets of Langerhans may occur without disturbances in carbohydrate metabo-

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lism but that under certain circumstances there is a definite relationship between the adenoma and a particular symptom complex due to hypoglycemia.

The case of hyperinsulinism due to a tumor of the islands of Langerhans in which operation was successful was mentioned by Mathias¹⁰ in 1928. Howland and

TABLE 1.—Summary of Seventy-One Preoperatively Diagnosed Cases of Islet Cell Tumors of the Pancreas

Benign adenomas successfully removed.....	37		
Benign adenomas; patients died postoperatively	8	45	63%
Total benign			
Malignant tumors successfully removed....	16		
Malignant tumors; patients died postoperatively	4	20	37%
Total malignant			
Benign adenoma removed without remission of symptoms	1	1	
Tumors with gross metastases.....	5	5	
Total	71	71	100%

his associates¹ were the first to report a case in detail. Since then, each year has seen an increase in the number of reported cases of tumors of the islet cells associated with hypoglycemia, until at present 53 cases in which operation was successful can be found.

The symptoms and signs of hypoglycemia are well known and easily recognized. They are first hunger and a feeling of nervousness, followed by perspiration and vertigo, going on to convulsions, coma and ultimately death. That these symptoms are due not only to hyperinsulinism but to any factor which might cause a lowering of the level of the blood sugar has been brought forward many times (Gammon and Tenery,¹¹ West and Kahn,¹² Akerberg,¹³ Nicholson and Hart¹⁴ and Harris¹⁵). Wauchope¹⁶ gave an excellent summary of the conditions producing hypoglycemia (table 2).

As can be seen, the differential diagnosis of hypoglycemia states is a large and varied problem. Fortunately many causes can be easily eliminated, but the remainder, which include tumors and hyperplasia of the pancreas, functional hyperinsulinism and those factors causing a lack of opposing secretions, are more difficult to differentiate.

The part played by the thyroid gland in the production of hypoglycemia is difficult to evaluate, since cases of proved adenoma of the islets of Langerhans with complete cure after operation have been found associated with basal metabolic rates varying from -21 per cent (White and Gildea¹⁷) to +28 per cent (Derrick and his associates¹⁸). Aitken¹⁹ reported a case presenting a basal rate of +80 per cent in which thyroidectomy relieved symptoms of hypoglycemia for one year, after which they recurred, and at operation

three years later an adenoma of the pancreas was removed, with complete cure.

The differentiation of hypoglycemia caused by diseases of the adrenal glands is not a matter of great difficulty because of the other factors by which Addison's disease may be diagnosed. The opposing secretions from pituitary tumors present a more difficult problem. In the cases reported by Friedman²⁰ there were seen at autopsy both islet cell adenomas of the pancreas and advanced adenomatous hyperplasia of the chromophil cells of the pituitary gland. Kalbfleisch²¹ reported a case in which there were five pancreatic adenomas, one of which had been surgically removed, the remainder being found post mortem, and reported also the finding of a hypophysial tumor.

The real difficulty in diagnosis rests between those cases of hypoglycemia due to functional hyperinsulinism and those due to tumors or to diffuse hyperplasia of the islets. Wilder²² gave three criteria which indicate the organic type of hyperinsulinism in contradistinction to the functional type. These are much the same as those employed by Whipple (cited by Wilder) and are (1) postabsorptive blood sugar values of less than 50 mg. per hundred cubic centimeters; (2) intolerance for (production of attacks on) fasting; (3) normal health and evidence of stability of the autonomic nervous system prior to the first episode of hypoglycemia (Wilder), and (4) relief of such attacks by the administration of sugar, preferably intravenously and without the patient's knowledge of what is injected (Whipple).

Both Whipple and Wilder expressed the opinion that the most important differential point is the response to fasting. Berry²³ came to similar conclusions by the use of tolerance tests done with increasing amounts of carbohydrates. He expressed the belief that

Cases of marked functional hyperinsulinism should react to increasing amounts of carbohydrates by a progressive lowering of the blood sugar, and starvation should allow the blood sugar to rise. If these postulates should prove true in other cases, then functional hyperinsulinism . . . should easily be sepa-

TABLE 2.—Condition Producing Hypoglycemia

I. Excess of insulin	
A. Therapeutic injection	
B. Tumors and hyperplasia of the pancreas	
C. Functional hyperinsulinism	
II. Lack of opposing secretions	
A. Disease of the adrenal glands	
B. Pituitary tumors	
C. Myxedema	
III. Lack of glycogen	
A. Destruction of reservoirs	
1. Disease of the liver	
2. Wasting of muscles	
B. Abnormal excretion of sugar	
1. Renal diabetes	
2. Lactation	
C. Active depletion of stores as in muscular exercise	
D. Failure to replenish stores, as in starvation	
IV. Interference with regulating center	
A. Nervous disease affecting the pons varolii	
B. Overaction of the vagus	

rated from other causes of hypoglycemia. From a study of blood sugar curves in cases of spontaneous hypoglycemia due to the presence of an adenoma or carcinoma of the pancreas it is suggested that these tumors are not under nervous or hormonal control and that they are continually secreting insulin.

10. Mathias: Adenoma of an Islet in the Wall of a Pancreatic Cyst, *Med. Klin.* 2:1814 (Nov. 16) 1928.

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20. Friedman, N. B.: Chronic Hypoglycemia, *Arch. Path.* 27: 994 (June) 1939.

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22. Wilder, R. M.: Clinical Diabetes Mellitus and Hyperinsulinism, Philadelphia, W. B. Saunders Company, 1940, p. 358.

23. Berry, J. A.: A Case of Hyperinsulinism Relieved by Partial Pancreatectomy, *Brit. J. Surg.* 22: 51, 1935.

John's²⁴ report on 3 patients with functional hyperinsulinism whom he treated by giving insulin before meals is of interest in the differentiation of functional and organic hyperinsulinism. He expressed the belief that, since there is a deranged mechanism of the production or regulation of insulin, the giving of insulin before meals would prevent the blood sugar from stimulating the secretion of insulin from the pancreas.

The value of the dextrose tolerance curve in the differentiation of hyperinsulinism is a subject of much debate. Smith and his associates²⁵ expressed the belief that there is no definite type of dextrose tolerance curve. Fraser, Maclay and Mann²⁶ mentioned the plateau type of curve as being characteristic of hyperinsulinism. Smith and Seibel²⁷ commented on the usual low dextrose tolerance curve found associated with hypoglycemia due to pancreatic tumors. West and Kahn¹² stated that in instances of proved hypoglycemia the high or plateau curve has been present most often.

In reviewing the reported cases of proved adenomas of the pancreas in which operations were done, we found reports of dextrose tolerance tests in 44. Of this number 31 presented a diabetic type of curve, an incidence of 70.5 per cent. Figure 1 is a composite

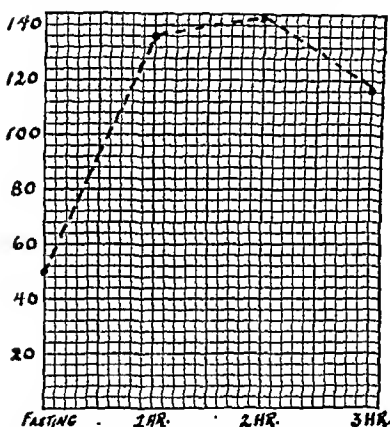


Fig. 1.—Composite graph of blood sugar values as shown by dextrose tolerance tests in 44 cases.

graph of all blood sugar values in dextrose tolerance tests gathered from the 44 cases.

REPORT OF CASE

History.—A white woman aged 41 was admitted to the Cook County Hospital on July 6, 1940 with complaints of "spells" for the past eighteen months and pain in the back. The first attack occurred on Dec. 25, 1938, when she awoke at 6 a. m. and had her breakfast as usual at 7 o'clock. At 10 o'clock

she felt tired, lay down and apparently fell asleep. At 11:30 her family tried to awaken her but she did not respond. At 2 p. m. she awoke but was unable to talk. She was helped from her bed to the kitchen and given food, after which she felt well.

Thereafter, she had daily attacks, occurring first before noon, and later earlier in the morning. The periods of unconsciousness varied from one-half to six hours, and there was one attack during which she was unconscious for twenty-five hours. She usually awoke spontaneously and felt perfectly well. Occasionally she felt hungry on regaining consciousness.

On infrequent occasions when members of the family were present they observed that she acted queer before the onset of an attack. On awakening she had no recollection of her former queer behavior.

In June 1939, after having suffered from these attacks for six months, she noticed that eating small meals throughout the day would decrease the frequency of the attacks. After January 1940 she could not control the attacks despite the fact that she maintained her previous dietary regimen. They came on

with increasing regularity, lasting for varying periods of time until the date of her admission.

She had a progressive gain in weight from 165 pounds (75 Kg.) in 1935 to approximately 200 pounds (91 Kg.) in 1939. From then to the time of her admission she gained about 35 pounds (16 Kg.).

Her past history was negative but for pneumonia in 1923 and the usual childhood diseases. She had had a uterine suspension in 1924 and a cholecystectomy in 1932. Her obstetric history included seven pregnancies, five of which ended in miscarriages, and she had a son and daughter, both living and well. Her menses began at the age of 13 and occurred every twenty-eight days lasting four days. There was slight dysmenorrhea and moderate bleeding.

Examination.—Physical examination revealed her to be well developed and well nourished; she did not appear acutely ill. The temperature on admission was 98.2 F., the pulse rate was 100 and the respiratory rate 28. The blood pressure was 110 systolic and 70 diastolic, expressed in millimeters of mercury. The remainder of the physical examination revealed no abnormalities except tenderness on palpation in the right upper lumbar region. At the time of the initial physical examination the patient had just been served her evening meal. She did not answer questions readily, and there was a vacant expression in her eyes. She moved her spoon automatically to her lips but did not swallow any food. She began to make guttural sounds and thrashed around in bed. Her arms were thrown from side to side; her body twisted. This lasted four to five minutes, after which she began to perspire profusely. The vacant stare and failure to respond to questioning lasted for another four to five minutes, after which time she appeared normal. For a few minutes she was slightly disoriented as to time, thinking that she had been in the hospital for a full day. She knew that she had had an attack but stated that she had no knowledge of what had taken place during the attack. She had left home early in the morning, having had only a cup of coffee. The journey to the hospital and the wait in the admitting room had prevented her from having her noon meal.

On the basis of the history and the attack at the time of admission, a tentative diagnosis of hyperinsulinism with hypoglycemia was made. This was confirmed the following morning, when a determination of the fasting blood sugar was reported too low to be read.

Laboratory Data.—The urine on admission showed no albumin or sugar, had a specific gravity of 1.015 and was normal on microscopic examination. The Kahn and Wassermann reactions were negative.

A determination of the blood sugar taken after a ten hour fast the morning after admission was reported as too low to be read.²⁸

The nonprotein nitrogen level was 48 mg., the creatinine was 2.1 mg. and the uric acid level was 5.1 mg. per hundred cubic centimeters. An oral dextrose tolerance test done on July 10 with 50 Gm. of dextrose gave all figures as too low to be read.

A roentgenogram of the abdomen showed no evidence of shadows of soft tissue or radio-opaque calculi. After a barium sulfate meal given on July 13 in an attempt to demonstrate any possible displacement of the duodenum by the pancreas, no evidence of extrinsic pressure on the duodenum and no pathologic condition in the stomach was noted. A roentgenogram of the chest showed no evidence of pulmonary disease. Visualization of the sella turcica showed a normal size sella with no erosion of the bone. Intravenous pyelograms revealed poor visualization of the calices and pelves of both kidneys.

The basal metabolic rate on July 12 was —5 per cent.

The blood showed 4,600,000 erythrocytes, 84 per cent hemoglobin and 9,550 leukocytes, with a differential count of 54 per cent polymorphonuclears, 34 per cent lymphocytes, 2 per cent eosinophils, 2 per cent basophils and 8 per cent monocytes.

The urinary diastase was 16 units (as determined by the Wohlgemuth method).

24. John, H. J.: Further Observations on the Treatment of Hyperinsulinism with Insulin. *Endocrinology* 19: 689 (Nov.-Dec.) 1935.

25. Smith, L. B.; Hashinger, E. H., and Engel, L. P.: Hyperinsulinism Due to Adenoma of Islets of Langerhans, *J. Kansas M. Soc.* 36: 363 (Sept.) 1935.

26. Fraser, R.; Maclay, W. S., and Mann, S. A.: Hyperinsulinism Due to a Pancreatic Islet Adenoma, *Quart. J. Med.* 7: 115 (Jan.) 1938.

27. Smith, M. G., and Seibel, M. G.: Tumors of the Islands of Langerhans and Hypoglycemia, *Am. J. Path.* 7: 723 (Nov.) 1931.

28. Determinations of blood sugar by the Folin-Wu macromethod are read as low as 15 mg. per hundred cubic centimeters. Values below this are not reported because of the inaccuracy in reading them and the presence of other reducing substances.

An Ewald test meal showed 25 degrees free acidity, 35 degrees total acidity and 10 degrees combined acidity. Examinations of the stool were consistently negative for blood.

A specimen of blood sugar obtained at 8:30 a. m. on July 13, after milk had been given several hours previously, was reported as 40 mg. per hundred cubic centimeters.



Fig. 2.—Section showing the tumor proper and the alveolar structure of the cells; $\times 252$.

Course in Hospital.—The patient was given a general diet, and a bottle of milk was left by her bedside. She was given instructions to drink a cup of milk whenever she felt an attack coming on.

She was observed at 8:30 a. m. on July 10, one hour after breakfast, complaining of being drowsy; she responded slowly but rationally to questioning and was covered with a profuse sweat. There was a slow response after the taking of 50 Gm. of dextrose by mouth.

She had another, more severe, attack on July 12, after a fast of fourteen hours in preparation for a determination of the basal metabolism. At this time she had convulsive movements of her extremities. She was relieved on receiving 100 cc. of milk by mouth.

She continued to have almost daily mild attacks up to July 20. On that day, after a twelve hour fast in preparation for another determination of the basal metabolism, she had a period of deep coma from which she was roused by the administration of 50 cc. of a 25 per cent solution of dextrose intravenously and 750 cc. of milk by mouth. The attacks continued almost every morning up to the day of operation.

Operation.—On July 27 operation for the removal of a pancreatic adenoma was performed. When the patient was under anesthesia with cyclopropane a transverse subcostal incision was made, the gastrocolic omentum was separated and the pancreas exposed. On the ventral surface of the body of the pancreas to the right of the midline was a 1.5 cm. tumor, which was removed.

The postoperative condition was good. The temperature remained at approximately 100 F. for the first week. During the second week it varied between 99 F. and 100 F. and remained normal thereafter. The incision healed well but for a draining sinus, which was almost entirely closed at the time of discharge one month after operation.

There were no periods of unconsciousness or convulsive seizures at any time postoperatively. The blood sugar levels are shown in table 3.

An oral dextrose tolerance test with 50 Gm. of dextrose on August 27 gave the following readings: fasting, 71; one hour, 136; two hours, 107, and three hours, 56.

An epinephrine tolerance test with 8 minims (0.5 cc.) of epinephrine, on August 28, gave the following: fasting, 93; fifteen minutes, 125; thirty minutes, 136, and forty-five minutes, 166.

An insulin tolerance test with 10 units of insulin, on August 29, gave the following: fasting, 93; one hour, 79; two hours, 75, and three hours, 62.

The basal metabolic rate postoperatively was -21 and -18 per cent.

The blood diastase level fifteen days postoperatively was 32 units.

Pathologic Report.—This was made by Dr. Alex B. Ragins, of the Department of Surgical Pathology.

TABLE 3.—Blood Sugar Levels After Operation

Date	Day After Operation	Level	Remarks
7/30	1st	115	Getting dextrose intravenously
7/31	2d	75	Fasting
8/ 5	7th	107	
8/ 7	9th	93	
8/13	15th	93	
8/24	26th	88	
9/30	63d	93	

The specimen consisted of a piece of tissue measuring 2 by 1.8 by 1.5 cm. It was a deep purple-red and was moderately firm in consistency.

The tumor was fixed in solution of formaldehyde and embedded in paraffin. Sections were stained with hemalum and eosin iron-hematoxylin, Mallory phosphotungstic acid, Heidenhain-Azan hematoxylin and Gomori's²⁹ stain for alpha and beta cells of the islet tissue.

Microscopic study revealed the small islet adenoma to be located on the surface of the pancreas and to be more or less distinctly separated from the pancreas by a few strands of connective tissue infiltrated by focal extravasations of blood and a few polymorphonuclear leukocytes. In other areas there was a definite extension of the tumor into the adjacent pancreatic tissue.

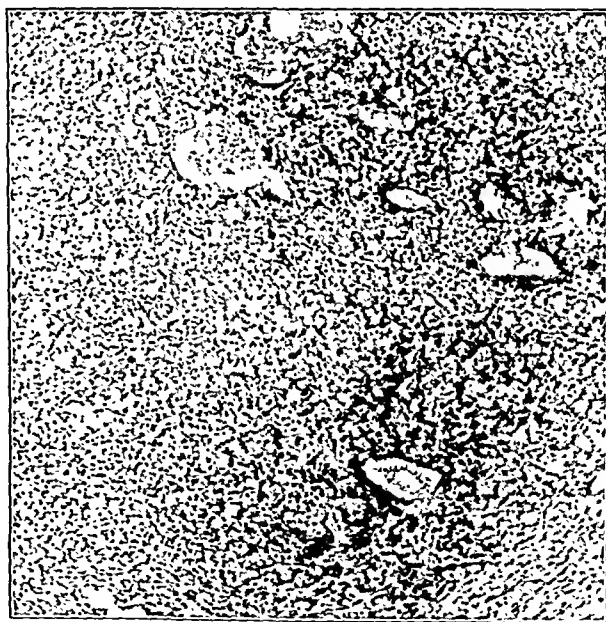


Fig. 3.—Section showing vascularity of tumor and focal extravasations of blood; $\times 72$.

The tumor proper was composed of nests of cells, some of them arranged in small trabeculae, others in the form of small alveoli (fig. 2). The latter structure was particularly evident where the tumor was solid. Scattered throughout the tumor, and particularly in the periphery, were numerous capillaries

29. Gomori, G.: A Differential Stain for Cell Types in Pancreatic Islets, *Am. J. Path.* 15: 497 (July) 1939.

engorged with blood, and about these areas were large focal extravasations of blood (fig. 3).

The individual cells contained round to oval, rather uniform nuclei having a vesicular distribution of chromatin. The cytoplasm of the cell stained pale purple-pink and was slightly vacuolated. The cytoplasmic membrane was indistinct. In places there were small focal areas of hyalinization.

With the Gomori stain, the cytoplasm of many of the cells stained a homogeneous light pink. The distinct granules of the cells as described by Gomori were not readily apparent. Basophilic granules in the cells were completely absent, and in many cells free of granules the cytoplasm was pale blue.

The pathologic diagnosis was islet cell adenoma of the pancreas.

Clinical Notes, Suggestions and New Instruments

LEAD IN URINARY CALCULI

FRANCIS CARTER WOOD, M.D., NEW YORK

In a recent issue of *THE JOURNAL* Trumper and Gordy¹ report an interesting case of lead poisoning under the title "Lead in a Renal Calculus" in which a calculus was removed from the right ureter. This calculus was of the phosphatic type and contained 3 per cent of lead. The urine when analyzed was within the so-called normal range. The writers say "As far as we have been able to learn from a careful search of the literature there has been no previous report of a urinary calculus which contained lead."

Some years ago I carried on a fairly extensive spectroscopic investigation of the metallic content of animal and human tumors. Traces of lead were frequently found. Other investigations showed that the source of this lead was in the food and drinking water. Traces of lead could be found in the water supply of the city of New York and in all of the root vegetables analyzed, most of which came from nearby Long Island and New Jersey farms. Specimens derived from New Hampshire were also found to contain lead. In the ash of the tumors as well as of the vegetables, sodium, potassium, calcium, magnesium, iron, silicon, boron, phosphorus, carbon and aluminum were present in all samples examined. Traces of copper, lead and silver were regularly present. Chromium, zinc, manganese, vanadium, nickel, titanium and lithium generally occurred. Barium and strontium were only infrequently seen. Occasionally rubidium was present. It is obvious that the mineral content of the tumors was merely an expression of the food which the animals or the human beings used. Most of these metallic substances can be recognized in a few grams of ash from a root vegetable, from a tumor or from normal organs, especially the liver. The spectroscopic methods used were exceedingly delicate, and it should be understood that these metals were present only in traces. These facts are not new. The Department of Agriculture published a large number of analyses of plant substances many years ago in which most of these facts were presented.

In the course of this work a discussion arose in medical circles suggesting that the increase in the occurrence of lead poisoning was due to ethyl gasoline from inhalation of motor exhaust. I happened to be in the possession of a collection of bladder calculi removed about 1850-1860. Analysis of some 20 of these calculi of different types showed that they all contained lead, thus proving that lead was as abundant in the urines of patients in 1855 as it is at present, so that ethyl lead can have little or nothing to do with the presence of lead in the body. These analyses were checked with the analyses of about 20 modern calculi furnished me by Prof. J. Bentley Squier, head of the Department of Urology of Columbia University. These also showed lead in practically all cases. A small freshly passed uric acid calculus and 1 of cystin were the only types in which no lead was found. The explanation is

simple. The presence of bacteria sets up a chronic inflammatory process in the bladder, the urine becomes alkaline, and the alkali precipitates the calcium and magnesium phosphates, which may ultimately form a calculus. As the precipitate forms, it carries with it all the lead and other elements which form insoluble phosphates or carbonates. The identification of the lead is made in the spark spectrum as follows: About 1 Gm. of calculus is pulverized and dissolved in a small amount of nitric acid which had previously been checked and found to contain no lead in 100 cc. As the lead content of the ordinary laboratory distilled water is rather high, it is necessary to prepare special water by redistillation of the ordinary distilled water with acid and then alkali in a pyrex glass still. The diluted and still acid fluid is then electrolyzed, a pure gold wire being used as an electrode. After the current has been on for a few hours the gold wire is removed from the fluid, clamped in a holder, and a condensed spark at about 15,000 volts passed between this wire and another pure gold wire which is not contaminated with lead. The identification of the lead line in the spectrum photograph is exceedingly easy, as on either side of the most sensitive lead line are two well marked gold lines having a wavelength of 4,065 and 4,052.8 angstroms. Thus they lie on either side of the lead line, which is at 4,057.8 angstroms.

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STERILITY OF THE MALE AFTER SYMPATHECTOMIES

GEZA DE TAKATS, M.D., AND LORING S. HELFRICH, M.D.
CHICAGO

The surgical literature contains many references to the loss of the power of ejaculation from the seminal vesicles and the prostate gland when the first lumbar sympathetic ganglion is removed.¹ The preganglionic motor fibers leave the spinal column through the upper lumbar white rami and join the presacral nerve through the lumbar sympathetic chain and the lateral roots of the superior hypogastric plexus. Presacral neurectomy destroys the postganglionic neuron, and, while libido and orgasm are unimpaired, the power of ejaculation is definitely lost.² With the wider application of high lumbar sympathectomy and section of the splanchnic nerves in our clinic for selected cases of Raynaud's disease, thrombo-angiitis obliterans, reflex dystrophy, hypertension and megacolon, the question of male sterility has frequently arisen. It might be said that in most cases of this type a hereditary factor is unmistakable and that male sterility without loss of libido and orgasm is not so unfortunate. Nevertheless, no actual study of condom specimens for motile spermatozoa has heretofore substantiated the assumption that spermatozoa are not ejaculated during coitus. For this reason we have studied for several years the semen of patients who have had different types of sympathectomies. As the usual lumbar sympathectomy does not remove the first lumbar ganglion, the finding of motile spermatozoa in patients who have undergone this operation was not surprising. Then, again, most of our sections of the splanchnic nerves and upper lumbar sympathectomies were done on women; furthermore, the boys on whom this operation had been done for megacolon have not yet reached puberty. Recently, however, a case which seemed suitable for study presented itself. The patient had had multiple sympathectomies—a large part of the sympathetic nervous system having been removed—and he was willing to cooperate.

REPORT OF CASE

J. P., a man aged 25, a press punch operator, admitted to our service at the Research and Educational Hospital, complained of pain and ulceration of the toes, blueness of the fingers,

From the Department of Surgery, University of Illinois College of Medicine, and the Research and Educational Hospital.

1. White, James C.: *The Autonomic Nervous System*, New York. Macmillan Company, 1935. Homans, John: *Circulatory Diseases of the Extremities*, New York. Macmillan Company, 1939. Passler, H. W.: *Megacolon and Megacystitis*, Leipzig. Johann Ambrosius Barth, 1938.

2. Learmonth, J. R.: A Contribution to the Neurophysiology of the Urinary Bladder in Man. *Brain* 54: 147 (June) 1931. Baqy, Z. M.: Impotence of the Male Rodent After Sympathetic Denervation of the Genital Organs. *Am. J. Physiol.* 96: 321 (Feb.) 1931.

1. Trumper, Max, and Gordy, S. T.: Lead in a Renal Calculus. *J. A. M. A.* 116: 1389 (March 29) 1941.

dizzy spells and nervousness. He was quite well until September 1938, when pain appeared in the fifth toe of his right foot; after some heat and roentgen treatments the skin broke down. Because of the pain and recurrent ulcerations in other toes and fingers he had to give up his job. He had lost 35 pounds (16 Kg.) during the last year. Nothing seemed to relieve the pain.

On entrance to the hospital the retinal vessels were narrowed with some arteriovenous nicking. The blood pressure was 180 mm. of mercury systolic and 122 mm. of mercury diastolic. The electrocardiogram showed myocardial damage with angina on effort. The urea clearance was 30.2 cc. a minute; the urea ratio was 44. A split renal function test showed delay in the appearance of phenolsulfonphthalein, chiefly on the left side. Pyelograms were negative. The distal phalanges of all fingers except the thumbs were cold and cyanotic. The toes were also cold and dark blue. The third toe of the left foot had been removed and the fifth toe was gangrenous. Microscopic examination of capillaries showed capillary stasis and arteriolar obstruction in the fingers and toes. Biopsy of muscle tissue revealed arteriolar sclerosis with a wall to lumen ratio of 1:1. A diagnosis of diffuse arteriolar disease with hypertension of unknown etiology was made.

Operations were performed as follows: left and right cervico-dorsal sympathectomy on Nov. 28, 1939, left lumbar sympathectomy on December 5, right lumbar sympathectomy with renal biopsy on Jan. 23, 1940, left transdiaphragmatic section of the splanchnic nerve (Smithwick) on February 12 and right transdiaphragmatic section of the splanchnic nerve on August 16. Actually the entire thoracic and lumbar chain from the stellate ganglion to the fourth lumbar ganglion and both splanchnic nerves from their highest root (fifth dorsal) to the celiac ganglion were removed. Only the fourth and fifth dorsal sympathetic ganglia remained.

The cyanosis and ulceration of the extremities were promptly relieved. The anginal pains disappeared. Biopsy of renal tissue revealed arteriolar sclerosis. The blood pressure one month after the last splanchnic nerve section was 160 systolic and 100 diastolic with a drop to 85 systolic and 40 diastolic when the patient stood up. Two months after operation the blood pressure fell to 115 systolic and 80 diastolic with the patient in the horizontal position, dropping to zero when he stood still for five minutes. Four months after operation the blood pressure with the patient lying down was 110 systolic and 80 diastolic, and a systolic pressure of 60 with the patient standing. Five mg. of amphetamine sulfate relieved the dizziness on rising in the morning. This was the only complaint. The patient felt well and started working again.

Four months after operation a condom specimen was examined. The patient lived in a neighboring city and the specimen was three hours old when the examination was made; nevertheless there were at least six active motile spermatozoa and a large number of nonmotile spermatozoa in the specimen, indicating that the power of ejaculation was preserved in this patient.

COMMENT

We place this case on record because we possess good proof of complete splanchnic nerve section as evidenced by the maximal postural hypotension. The patient's first lumbar ganglia have been removed, as demonstrated by the loss of sweating in the characteristic areas of the extensor surfaces of the upper third of the thighs. While a single case is insufficient to settle the question of male sterility after section of the splanchnic nerve and high lumbar sympathectomy, it shows that sterility does not have to occur. This finding does not contradict the statement that resection of the hypogastric plexus paralyzes the nonstriated muscle of the seminal vesicles and the prostate; on the contrary, it suggests a possible independent reflex ganglionic activity of cell stations deprived of their spinal connections or that other connections are present. We hope to stimulate further studies of this nature in other clinics so as to confirm or dispel the prevalent opinion that most extensive sympathectomies render male patients sterile.

SUMMARY

A number of motile and nonmotile spermatozoa were found in the condom specimen of a man aged 25 four months after an extensive section of the splanchnic nerve and bilateral dorso-

lumbar sympathectomies. This finding contradicts the often voiced but undocumented opinion that such sympathectomies produce sterility in the male.

122 South Michigan Avenue.

SURGICAL GOWN WITH INSTRUMENT POCKETS

WESLEY J. WOOLSTON, M.D., PASADENA, CALIF.

The accompanying illustration obviously explains the principle of the gown to be described. It is nothing more or less than a surgical gown patterned after a carpenter's apron. The first point of importance which occurred to me and which likewise will occur to the reader is the possibility of contamination of the instruments placed in the various pockets of the gown. In order to safeguard this point I have a triple thickness of material behind the pockets. After an experience of two years I find this to be ample. To those who might question the efficacy of this, an apron of either cellophane or thin rubber may be used to protect the cloth from the perspiration of the operator. To



Surgical gown with instrument pockets.

any objection which might be raised as to any discomfort occasioned by having the extra layers of cloth in back of the pockets I might add that it represents such a small proportion of the gown that any added warmth is negligible. The pockets can be made in various sizes or depths according to the idea of the surgeon. Two of the instruments that always seem to be the most elusive are tissue forceps and scissors. Each of these instruments has a small pocket of its own; it is obligatory for the nurse to see to it that each pocket is always loaded with the proper instrument. To the surgeon who has simplified his work so that he uses few instruments and those of standard type, especially hemostats, few pockets are necessary. I had such gowns made for my own personal use but soon found the assistants playing "pick-pocket." They found it more convenient to reach into the pocket of my gown than to ask the nurse to get the instrument from the tray and hand it to them.

One of the anesthetists calls the contrivance "Woolston's kangaroo gown" because it has so many pouches. Incidentally, it is possible, with the use of the gown, to get along in a pinch with one less clean nurse than formerly.

In other words, the old saying "a place for every thing and every thing in its place" may well be applied to this gown.

2580 San Pasqual.

AN OUTBREAK OF BOTULISM

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On March 22, 1941 a family of 6, 2 adults and 4 children aged 7, 9, 11 and 12 years respectively, partook of a meal designated as supper at approximately 6 p. m. The supper consisted of macaroni, prepared with commercially canned mushroom sauce designated as Italian style, milk, apples and oranges. The food of all previous and later meals was considered of no consequence in the light of the clinical symptoms developing in 3 of the children and the subsequent field or epidemiologic investigation. It is of importance to note that the commercially canned mushroom sauce was not heated but was poured directly over the cooked macaroni and served, the 3 children affected obtaining the first servings. The remaining persons, 2 adults and 1 child aged 7 years, likewise consumed this mixture of macaroni and unheated mushroom sauce.

The first symptoms of botulism occurred in 1 child, aged 11, at 4:30 a. m. March 23, in the second child, aged 9, at about 11 a. m. and in the third child, aged 12, at 2:30 p. m. Repeated examination of the other members of the family, mother, father and 1 child aged 7, revealed no symptoms, nor did any develop that could be suggestive of botulism.

The case history of the child who died follows:

History.—A. M., a white schoolboy aged 9 years, entered the Isolation Division of the San Francisco Hospital March 23, 1941 at 4:20 p. m. Between 10 and 11 a. m. he had complained of a slight stomach ache but had been able to eat a little lunch and to go with his mother and sister to a picture show. About 2 p. m., while in the show, he complained that his stomach ache was worse and said his feet were heavy. For a time he was unable to talk and could not stand or walk. He was taken to the Mission Emergency Hospital, and gastric lavage was done. Later, he was sent to the isolation hospital with a tentative diagnosis of botulism.

Examination.—The temperature was 98.6 F., the pulse rate 120 and the respiratory rate 20. The blood showed 88 per cent hemoglobin (Sahli), 4,900,000 erythrocytes and 10,200 leukocytes, with 78 per cent polymorphonuclear cells and 22 per cent lymphocytes.

The boy was well nourished and developed and was dark skinned. He was drowsy but could be awakened and was rational and cooperative. The speech was scarcely understandable, because of thickness. The breathing was shallow and quiet, but there was no cyanosis. The boy complained of a stomach ache and double vision.

The head was normal. There was ptosis of both eyelids. The pupils were dilated and did not react to light or in accommodation. There was first degree lateral nystagmus. There was convergent strabismus at times divergent on the eyes' trying to accommodate. Diplopia and photophobia were present. All reflexes were hypoactive. The tongue was in the midline and the gag reflex was present. The patient could slowly swallow water. On being supported in a sitting position in bed he was unable to support the head erect except momentarily. The thorax showed no unilateral lag, and the breathing was shallow, mostly with the upper part of the chest. The lungs were clear and the heart was normal. There were slight tympanitis and generalized tenderness of the abdomen. The extremities showed general myasthenia with a tendency to flaccidity.

Treatment.—At 6 p. m. the patient was given 1 ounce (28.3 Gm.) of magnesium sulfate, which was promptly vomited. At 9 p. m. he was given 2,500 units of botulinus bivalent (A and B) antitoxin in 1,000 cc. of a 5 per cent solution of dextrose intravenously, one hour after an intradermal sensitivity test, with no reaction.

March 24 at 8:30 a. m. the patient seemed somewhat brighter; otherwise all symptoms were the same except that

the speech was thicker. He asked for ice cream, which he took with relish, being fed by his nurse. At 11:30 he received 10,000 units of bivalent (A and B) botulinus antitoxin in 1,000 cc. of a 5 per cent solution of dextrose in physiologic solution of sodium chloride intravenously. During the morning he had periods of slow respirations but no cyanosis. At 12:55 p. m. his respirations were more shallow, and apparently respirations of the sternocleidomastoid type came on suddenly. He was placed in the Drinker respirator and given 1 cc. of a 1:1,000 solution of epinephrine intramuscularly. He died at 1:10 p. m. in the respirator and after death was given 1 cc. of epinephrine into the heart.

Diagnosis.—A diagnosis of botulism was made. A report received April 7 from Dr. K. F. Meyer, of the Hooper Foundation, University of California, said "The evidence strongly suggests that a rare type of *Clostridium botulinum* type E was responsible for the illness."

Similar treatments were administered to the 2 remaining patients, with complete recovery. It was necessary, however, to place 1 of them in a Drinker respirator for several days. Likewise, 20,000 units of type A and B botulinus antitoxin was given intravenously to both patients with dextrose solution. Decided "limber neck" occurred and remained for twenty-four hours.

The field evidence was interesting. The can was not a "swell," and its contents were stated to have been normal in taste, odor and appearance. The empty can with a few shreds of material was obtained from the accumulated garbage. As reported by Dr. Meyer, it was from the enrichment cultures of the contents remaining in this can and from the gastric washings of all the patients that toxin of *Cl. botulinum* type E was demonstrated.

The factory at which the mushroom sauce was produced is under the inspection of the state of California and meets every sanitary requirement. The record of the required temperature for the cooking process was in order and readily available, and the possibility of a can or cans not reaching the sterilizer appears remote. The can involved (a no. 1 can) was processed at 240 F. for forty-five minutes. There was discussion as to a varying p_n of the final mixture, the range of p_n extending from 4.2 to 4.9. Likewise, the consistency of the material in the can may vary, which not only may affect the preheating to 160 F. but may have some effect on the penetration of heat during the final heating process. Further investigation of all these matters and additional study of possible heat-resistant strains may materially improve the present prescribed process. The mushrooms used came from Yugoslavia, were dried and were packed in sealed cans. The laboratory data on the toxin demonstrated, type E (Gunnison, Cummings and Meyer¹), are indeed interesting.

COMMENT

The fact that this outbreak of botulism, 3 cases with 1 death, is the first in many years reported as being due to a commercially canned product is a rather remarkable and satisfactory record. The history of 6 persons' consuming the same food, with 3 showing no symptoms whatever, and the use of a prescribed heating temperature and process generally and heretofore regarded as safe, mark this outbreak of botulism as unusual in several features.

The clinical use of nonspecific botulinus antitoxin with recovery in 2 cases is of doubtful or no significance. It is indicative, however, of the necessity of being conservative in judging the effect of the antitoxin, specific as to type or otherwise, in cases of botulism. Any laboratory reports and animal inoculations indicating the presence of toxin, the type and the results of enrichment cultures may be so delayed or prolonged as to be of no use in any specific clinical treatment of patients. Furthermore, the rapidity of absorption or fixation of botulinus toxin has been demonstrated in many outbreaks of the disease and in laboratory experiments.

101 Grove Street.

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1. Gunnison, J. B.; Cummings, J. R., and Meyer, K. F.: *Clostridium Botulinum* Type E, *Proc. Soc. Exper. Biol. & Med.* 35:278, 1936.

Special Article

LEGAL RESPONSIBILITY FOR MEDICAL MALPRACTICE

VI. FURTHER INFORMATION ABOUT DIRECT CAUSATION AND DAMAGE

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This is the sixth and last of a series of articles on "Legal Responsibility for Medical Malpractice." The five previous articles were published in The Journal March 8, May 10, May 31, June 14 and June 21.

III. DIRECT CAUSATION (PROXIMATE CAUSE)

In law, as in medicine, the question of responsible cause, the relation of cause and effect, is a perennial inquiry; one constantly seeks to incriminate some causal agent when the "status quo" has been changed.

In medicine, as in law, the question arises: At what point should one rest in his effort to trace back the responsible or "efficient" cause? The pure scientist will say, "I shall halt only where crudities of present science momentarily make halting necessary; no cause can ever be too remote for concern, so long as some preceding cause still lies undiscovered." The medical practitioner will say, "I must concern myself with the immediate cause, the cause of the sudden illness of John Jones, which will enable me to treat him intelligently and fairly and do reasonable justice to his case. Practicality will not permit me to go into remote causes which lie entirely beyond my apparatus for diagnosis and the time at my disposal." He will say, with full knowledge that he speaks of immediate and not ultimate cause, "This man has been sick, but I have found the cause; it is a bronchogenic carcinoma. His condition calls for lobectomy." The pure scientist will say, "Here is a bronchogenic carcinoma. It is an effect for which I must find the cause. Its purposeless mass must be caused by excessive increase of cells, but this is caused through unrestrained and ceaseless division by mitosis. However, this is no answer, for such wild and unruly growth in defiance of the normal laws of growth must be caused by lack of a principle of restraint which usually checks growth at the physiologic optimum." In this vein, the pure scientist pushes back in his investigations from one remote cause to another more obscure. He would consider it negligence to drop the inquiry short of the range of the furthestmost causal connection.

The law, like the ordinary practitioner who administers medicine, from reasons of practical urgency must often forego the tracing of causation to its remote antecedents. The disputes which crowd the dockets of the court are numerous, and if the distant cause of every present effect were given legal significance corps of investigators, of psychologists and of experts of all sorts would be at work for months whenever John Brown stole the pig of Elmer Jones. The dispute could be made a "cause célèbre," a deep delving into remote aspects. But these litigants cannot afford the cost of this elaborate machinery or the time for such investigations; they have their hay to get in before the next rainfall. Nor does society contain enough members to man the microscopes in an "oil immersion" search for the spectre of absolute truth. Fixing final psychologic

responsibility would often call for fathomless exploration. Consequently, courts are constrained to evolve rules for doing substantial justice, with the hope that the result in each particular case will closely approximate actual justice. They must set up certain norms of behavior as good or bad and make their standards for measuring conduct as objective as possible. They must fix, artificially to be sure, certain limitations on the tracing of antecedent cause and say, "Beyond these points practical exigencies of the present day do not permit us to go." There is no doubt that formulas for tracing the "proximate" or "legally efficient" cause depend to some extent on judicial conceptions as to where the risk of loss should fall. Thus, in certain cases courts hold that when an actor, as a reasonably prudent man, could not foresee injury of the character complained of, the item of damage is a "remote" and not a "proximate" consequence of his negligence. For such remote consequences, they will refuse to hold him legally responsible. This rule may be, and often is, held out as a purely logical rule of causation. In reality, it is a mechanism whereby risk of loss is removed from the shoulders of the man of action in a society which prefers initiative to passivity and changers of the "status quo" to hermits.

Realizing that rules of "proximate cause" have been bent by the tongs of practical exigencies and social policy while being hammered on the anvil of law, one will not be surprised if they diverge at times from strictly scientific conceptions.

The "direct causation" branch of my formula depends on the whole law of "proximate causation" as evolved and applied in thousands of diverse cases rather than on special principles relating to medical cases as an isolated group. It is a subject which has provoked difference of opinion among courts and controversy among scholars. But I feel, however sharp the clash of points of view, that the reader needs some point of departure. Few sources could serve as a safer or more enlightening introduction to general principles than the distinguished writings of Prof. Joseph Beale, from which I quote certain passages and illustrative cases verbatim.¹

1. ——— a non-actor ——— should be held responsible only if his failure to act was in itself a legal wrong, that is, if he had a duty to act.²

2. Starting with a human act, we must next find a causal relation between the act and the harmful result. . . . Where the act is the failure merely of a legal duty (omission to act) causation is established only when the doing of the act would have prevented the result; if the result would have happened just as it did, whether the alleged actor had done his duty or not, the failure to perform the duty was not a factor in the result, or, in other words, did not cause it.

Example: In *Ford vs. Trident Fisheries Company*, 122 N. E., Massachusetts, 389, 1919, where Ford, the mate, fell from the defendant's vessel and never rose to the surface, and the ship's boat was negligently lashed to the deck so that it could not be seasonably launched and used; it was held that in the absence of evidence of the possibility of saving Ford, causation by the defendant had not been proved.³

1. Beale, J. H.: *The Proximate Consequences of an Act*, Harvard Law Rev. 33: 633, 1921.

2. This is a result reached equally under principles of proximate cause or on alternative lack of "dereliction," since omission to act cannot constitute negligence when there is no duty to act. See part V of this paper, which treats of duty and dereliction (J. A. M. A. 116: 2755 [June 21] 1941).

3. A number of malpractice cases have been won by physicians on this failure of a plaintiff to meet his burden of proof of causation. For example, in *Ramberg v. Morgan* (Iowa Supreme Court) 1928, 209 Iowa 474, 218 N. W. 492, a police surgeon was negligent in diagnosing the mortal injury to the brain of an unconscious motorist as intoxication and in failing to refer him to an available hospital for proper studies; but no legal liability was made out because the decedent's widow failed to prove that proper action could have averted the death.

3. It has been seen that an act which in no degree contributed to the result in question cannot be a cause; but this, of course, does not mean that an event which might have happened in the same way, though the defendant's act or omission had not occurred, is not a result of it. The question is not what would have happened, but what did happen.

Example: A murdered man would have died in time if the blow had not been given; yet, the murderer's blow is a cause of his death. A man would have died from a small dose of poison, yet if he was given twice as much, the entire amount of poison given him was a cause of his death.⁴

4. If two persons are active in bringing about a result, either by act or wrongful omission, each act or omission is no less a cause of the result because the result might have happened exactly as it did, though one of the persons had not acted, the cause attributable to the other having been sufficient to bring about the result. One might have caused the result, but in fact both did so.

Example: Where several persons, owning separate oil wells, allowed oil to escape into a creek, where it became ignited and eventually burned plaintiff's building, each owner is a cause, and if the result is proximate, all are equally liable. (*Northrup vs. Rakes*, Oklahoma Supreme Court, 178 Pac. 266, 1919.)

5. A result is none the less attributable to the defendant's act or omission because it was followed or accompanied by a wrongful omission on the part of some one else. Thus, if it is the duty of two persons to do a thing and neither does it, the resulting injury is attributable to either failure.

Example: Defendant was bound to supply a dry floor for workmen; another was employed to dry the floor by sanding. The floor being wet and not sanded, plaintiff slipped and was injured; this was the result of defendant's failure in duty. (*Harrell vs. Columbia Mills*, 98 S. E. [S. C.] 324, 1919.)⁵

6. The whole problem may, therefore, be stated thus: When is one responsible for the operation (a) of an active force which he has created; (b) of an active force which acts upon a passive force which he created, or upon a passive force which he was legally bound to change . . . if the principle of proximity is discoverable, it must be by some method of relating the defendant's act to the final active force.

(Professor Beale's article continues with the declaration that proximity of result does not require the result to be physically direct or direct in time or place, but it must be logically direct—direct in causal sequence.)

7. The connection of the defendant with the final active force may be sought in two ways. His connection with it may have been an active one; either by himself bringing it into existence, or by causing another person to do so. On the other hand, the defendant may have acted, and the force thereby loosened, may have spent itself, coming to equilibrium in the form of a

condition of forces which may or may not be stable. If, then, this condition is unstable, if it is in appreciable danger of being acted upon by an oncoming force, the defendant who thus created a condition in the path of an oncoming force stands in a certain causal relation to the latter force, though the relation is worked out through the passive line. The same thing may be said if the defendant whose duty it was to change a condition, which was in danger of such an oncoming force, failed to remove the condition; in that case also he comes into a causal relation with the new force.

8. Further Elaboration of 7.

a. Cases illustrating principle "that a direct result of an active force is always proximate."

1. Injury direct and immediate, but unforeseeable.

Example: The defendant assaulted the victim; the victim had heart disease, and died of fright. Defendant is the direct and proximate cause of the death. (*State vs. O'Brien*, 81 Ia. 88, 46 N. W. 752, 1890.)

b. Injury caused by direct transmission of defendant's force, as by one brick in a row being caused to fall upon the next until the last brick is thrown down.

Example: Defendant with his tug wrongfully ran against a pile in the river; the force was transmitted through intervening piles until it threw out a brace to keep two piles apart, and plaintiff's leg was caught between these two piles. This was the direct and proximate result of defendant's act. (*Hill vs. Winsor*, 118 Mass. 251, 1875.)

c. Injury caused by the aggravation of a preexisting disease or unhealthy condition.

Example: Where a latent disease was aggravated by defendant's act, the act is the direct and proximate cause of the entire result. (*Vosburg vs. Putney*, 80 Wis. 523, 50 N. W. 403, 1891; *Hahn vs. Delaware, L. & W. R. R.*, 92 N. J. L. 277, 105 Atl. 459, 1918.)

d. Injury caused through the creation and later development of a septic or diseased condition.

Example: Where the injury causes septic changes in the body, there being no new outside force concurring, the resulting harm is a direct and proximate consequence of the injury. (Development of septicemia: *Armstrong vs. Montgomery St. Ry.*, 123 Ala. 233, 26 So. 349 1899; development of carbuncle followed by septic infection: *Day vs. Great E. C. Co.*, 104 Wash. 575, 177 Pac. 650, 1919; development of tuberculosis: *Clarke vs. New A. C. Co.*, 179 Pac. [Cal.] 195, 1919.)

In one important class of cases, however, the courts seem to have held the opposite view. Where defendant negligently caused a physical injury, the immediate effect of which was the insanity of the injured person, who in a fit of insane mania committed suicide, the death is held not to be a proximate result of the injury. (*Scheffer vs. Washington C. V. M. & Ct. S. R. R.*, 105 U. S. 249, 1881.) This opinion seems hardly reconcilable with the current of authority on this subject.

c. Injury caused through the subsequent action of already operating natural forces.

Example: The defendant, a master of a vessel, carelessly missed stays in a high wind and flood tide, and the wind and tide carried his vessel against a sea wall and injured it; defendant's negligent act is a proximate cause of the injury to the wall. (*Romney Marsh vs. Trinity House*, L. R. 5 Ex. 204, 1870.)

9. It is to be noticed that the direct result of a passive cause is not necessarily proximate; proximity of result following primarily the active line.

Example: Where a train stood more than five minutes across a highway, in violation of law, and plaintiff's automobile driving along the highway collided with it; the position of the train was held not to be a proximate cause of the collision, but "only a condition." (*Gilman vs. Central Vermont Rys.*, 107 Atl. Vt. 122, 1919.)

10. Though there is an active force intervening after defendant's act, the result will nevertheless be proximate if the defendant's act actively caused the intervening force. In such a case the defendant's force is really continuing in active operation, by means of the force it stimulated into activity.

4. See *Grainger v. Stall* (Missouri Supreme Court) 1905, 187 Mo. 197, 85 S. W. 1114, 70 L. R. A. 49, which holds that a physician who improperly treats incipient disease of the hip as a partial dislocation of the joint, by reason of which the patient is subjected to great sickness and suffering and crippled for life, cannot escape liability on the ground that the same result would have ensued from the disease alone if he had not interfered. Justice Marshall said: "It stands to reason that inflammation is not cured or bettered by irritation or by rotating the parts so suddenly and violently as to result in fever and great soreness. If the plaintiff had hip disease, it was in the first stages, and, therefore, she stood a better chance of having the disease arrested or cured by proper treatment than she would stand after her hip had been subjected to the violent treatment that the defendant subjected it to. It is too plain to admit of argument or serious question that it does not lie in the defendant's mouth to say that the same results would have ensued from hip disease even if he had not treated her as he did. It could as well be argued that where a patient is improperly treated for a fracture of a limb, and gangrene sets in and the patient dies, that the physician is not liable because the patient had consumption and would have died anyway. A patient, however afflicted, is entitled to let nature take its course, and not have even natural consequences precipitated by the improper treatment of the physician, or by an improper diagnosis, and hence the improper treatment applied."

5. Patient X, suffering from a dislocation of the hip, goes to physician Y, who negligently diagnoses the condition as rheumatism and so treats it. Two months later, A quits X and consults Y, who correctly diagnoses the condition by means of a roentgen examination, but negligently abandons efforts to reduce it, treating A only by massage. X is liable for the end deformity, and so is Y. The breach of duty by one is no defense to the other. It does not break the chain of proximate causation or afford ground for mitigating damages. As is often the case in such situations, more than one component of my malpractice formula, "duty, dereliction, direct causation and damage" is involved. In this case, both direct causation and damage are involved and, in one sense, duty as well. This problem will be adverted to again under "damage."

a. The simplest case of this sort would be an effective request to the intervening party to act, as in the typical case of A employing B to kill C, or of A commissioning B to make a contract with C.

Note: This is really the basis of the rule in the law of agency that a principal is responsible for the authorized act of his agent. ("Qui facit per alium facit per se.")

b. Defendant may by his conduct so affect a person or an animal as to stir him to action; the result of such action is chargeable to defendant.

Example: Defendant, driving a sleigh, ran into a horse attached to another sleigh; the horse bolted and struck the plaintiff. Defendant is a proximate cause of the injury to plaintiff. (*McDonald vs. Snelling*, 14 All. [Mass.] 290, 1867.)

11. The defendant by his act may put some one in danger of loss (or of further loss) and that person may thus be caused to act defensively; the direct result of this defensive act is a proximate result of defendant's act. The intervening actor is usually the person whose rights are endangered by defendant's act.

Example: Defendant, while driving a horse in the street, suddenly and negligently pulled around to avoid a coming vehicle; plaintiff, jumping out of the way of defendant's horse, got in the way of the other vehicle and was injured. This injury was a proximate result of defendant's act. (*Baggs vs. Jewell Tea Co.*, 263 Pa. 413, 106 Atl. 781, 1919.)

12. The intervening person may be a third person, acting either of his own motion or by employment of the person whose rights are in danger.

Example: Defendant wrongfully filled plaintiff's cellar with explosive illuminating gas; plaintiff sent a plumber into the cellar to find the leak. The plumber lit a match to find the leak, and the gas exploded, damaging plaintiff's house; this was a proximate result of defendant's act. (*Burrows vs. March Gas Co.*, L. R. 5 Ex. 67, 1870.)

This is the basis of the responsibility of the person causing a personal injury for the act of a physician or surgeon in attempting to cure the wound.

Example: Defendant wounds plaintiff, who calls a physician to cure him; the physician, whether carefully or negligently, does an act which injures plaintiff; this is a proximate result of the wound. (*Com. vs. Hackett*, 2 All. [Mass.] 136, 1861; *Purchase vs. Seelye*, 231 Mass. 413, 121 N. E. [Mass.] 413, 1918; *Haoyman vs. Pecvc*, 168 Wis. 420, 170 N. W. 282, 1919.)

It is to be noted that the defendant is responsible for the physician's act only if that act is bona fide intended as an attempt to cure the harm inflicted by defendant. If the physician should seize the opportunity to experiment, or maliciously to harm the victim, the defendant's act would not cause the physician's. In the *Bush* case (*Bush vs. Commonwealth*, 78 Ky. 268, 1880), the attending physician communicated scarlet fever to the defendant's victim. This was held not a proximate consequence of defendant's act. Nor is defendant responsible for a mistake of a nurse employed to carry out the directions of the physician who administers a wrong and harmful remedy. (*Thompson vs. Louisville & N. R. R.*, 91 Ala. 496, 8 So. 406, 1890.)

13. The defendant by his attack upon another may cause the person attacked (or that person's husband) to act in defense, and thereby be the proximate cause of the direct result of such action.

Example: An assured person made an attack upon a woman; her husband in her necessary defense killed him. The assured person caused his own death. (*Bloom vs. Franklin L. I. Co.*, 97 Ind. 478, 1884.)

14. In Pennsylvania . . . the courts have usually refused to regard the direct result of an active force as proximate unless it is foreseeable.

Example: An engine on defendant's railroad negligently hit a woman at a crossing, and threw her body against plaintiff, injuring him; this was held to be a remote result of hitting the woman. (*Wood vs. Pennsylvania R. R. Co.*, 177 Pa. 306, 35 Atl. 699, 1896.)

15. If the defendant's active force has come to rest, but in a dangerous position, creating a new or increasing an existing risk of loss, and the foreseen danger comes to pass, operating harmfully on the condition created by defendant and causing the risk of loss, we say that the injury thereby created is a proximate consequence of the defendant's act.

Example: A sick seaman was sent aloft by the master of the vessel, it being apparent that he was in danger there; the seaman, by reason of his weakness fell overboard. This was a proximate result of the master's act. (*United States vs. Freeman*, 4 Mason [U. S.] 505, 1827.)

Example: A manufacturer sold a loaded rifle as unloaded; it was accidentally discharged and injured plaintiff; the injury was a proximate result of the manufacturer's act. (*Herman vs. Markham A. R. Company*, 258 Fed. 475, 1918.)

16. On the other hand, where defendant's active force has come to rest in a position of apparent safety, the court will follow it no longer; if some new force later combines with this condition to create harm, the result is remote from defendant's act.

Example: Defendant railroad put plaintiff, a passenger, off the train at the wrong station; she was forced to spend the night at a hotel there, and was injured by the explosion of a lamp in her room. The injury was not proximate to defendant's act. (*Central of Georgia Ry. vs. Price*, 106 Ga. 176, 32 S. E. 77, 1898.)

The commonest phrase, probably, is that the "injury shall be the natural and probable result of the act" . . . a more accurate phrase, which is gaining in use, is that the intervening force, unless it is to make the result remote, must be foreseeable.

17. It has been argued that the mere fact of the new force being foreseeable will not make the result proximate to defendant's act; it is only where the risk of the new force was created or increased by the act. This is believed to be the rule upon which the courts actually proceed.

Example: Where a railroad improperly delays carriage, and then starts it again, and in later crossing a floodplain the goods are destroyed by a flood, the chance of which was as great at the time the goods should have been at the place as at the time they were there; the delay should not be regarded as a proximate cause of the damage. (*Denny vs. New York Central R. R.*, 13 Gray [Mass.] 481, 1859; *Contra, Michaels vs. New York Central R. R.*, 30 N. Y. 564, 1864.)

18. The doctrine of "attractive nuisance," so-called, is one of the law of Torts no less than of Causation; but it involves a causative element. One who leaves a thing, which attracts children to play with it, in a place where children can get it, thereby creates a situation of active danger; and, if the act of the child brings about a catastrophe, it is a proximate result of leaving the thing about.

Example: Defendant left an unlocked push-car near its railroad where children could get at it; a child pushed it on the track and was killed by a train. If the act of a child could have been foreseen, defendant is a proximate cause of the death. (*Follett vs. Illinois Central R. R.*, 288 Ill. 506, 123 N. E. 592, 1919.)

This doctrine is the basis of the explosive cases. Defendant gives a child a pistol, explosive cap, or something which by exploding would cause injury, or leaves it in the child's way; he is a proximate cause of any injury the child may do with it, so long as it remains in his hands. (*Anderson vs. Newport Mining Company*, 202 Mich. 204, 168 N. W. 523, 1918.)

It is to be noticed that if the explosive gets into the hands of an adult, the defendant's force has ceased to be an active danger; if the explosive thereafter gets into the hands of a child, defendant is not the proximate cause of anything this child may do with it. (*Pittsburgh Reduction Company vs. Horton*, 87 Ark. 576, 113 S. W. 647, 1908.)

19. It is often said that where a criminal, or as it is often put, an illegal act of another, intervenes after the defendant's act, the latter ceases to be a proximate cause.

Example: Defendant wrongfully left open a gap in the plaintiff's basement wall; thieves entered and stole plaintiff's goods. Defendant was not a proximate cause. (*Andrews vs. Kinsel*, 114 Ga. 390, 40 S. E. 300, 1901.)

This was a principal ground for holding the Cunard Steamship Company not liable for injuries suffered from the sinking of the *Lusitania*. (*The Lusitania*, 251 Fed. 715, 1918.)

In spite, however, of much authority to this effect, the statement must be regarded as exceedingly questionable. If an employee of a storage warehouse should leave a window open, it is submitted that the stealing of the goods would be a proximate result.

20. To sum up the requirements of proximity of result:

1. The defendant must have acted (or failed to act in violation of a duty).

2. The force thus created must (a) have remained active itself or created another force which remained active until it directly caused the result; or (b) have created a new active risk of being acted upon by the active force that caused the result.

I make no apology for reproducing so much of this helpful writing, for it is inaccessible to many readers. Beale's formulation of proximate causation has exerted considerable influence, and it has the additional virtue of providing vivid illustrations.

In *Vigneault v. Dr. Hewson Dental Company*, 1938, 15 N. E. (2d) 185, the Supreme Judicial Court of Massachusetts accurately stated the rule as to the degree of certainty required in the proof of causation. A patient with an infected mouth had several teeth pulled by defendants who anesthetized him by multiple injections with needles rather than by using a safer "block method" currently employed by other dentists. The plaintiff recovered judgment for \$4,450 on an auditor's finding that the injections produced osteomyelitis. The defendant contended on appeal that causation had not been proved. The Supreme Judicial Court said, in upholding the judgment:

The plaintiff was required to establish that the negligence of the dentist was the reasonably probable cause of the disease, but was not required to exclude all other possible causes thereof.

Proximate causation has often been the crucial issue in malpractice cases. Detailed consideration of these interesting decisions rightfully calls for a separate study. In this paper it is possible only to introduce first principles.

IV. DAMAGE

Some persons might say that the fourth word used in my formula, "duty, dereliction, direct causation and damage," should be "injury."

I have avoided the latter term consciously, for it is a so-called "word of art" in law, used to signify "legal injury." "Legal injury," so used, implies that a plaintiff can show all elements requisite to establishing the alleged wrongful character of the defendant's conduct.

This special meaning is not agreeable to my approach, for I break down the conduct into separate and independent factors, and the presence of one essential ingredient is never intended to imply the existence of another. I have thought it better, therefore, to avoid the confusion which the word "injury" might import by making use of the term "damage" in its popular sense of "harm." Since legal compensation is not granted for every type of harm, I use the word "damage" in my formula to cover the types of actual harm for which the law will allow money damages to a plaintiff.

The question of damage should be broken down into the most basic inquiries one can frame in the suitable investigation of a particular problem. These I deem to be as follows:

1. Was there any actual harm?

2. Was the harm of a kind for which the law allows damages?

3. Even though the defendant was negligent, did his conduct cause the damage of which the patient complains?

4. What are the principles on which the court might permit an award of damages?

5. Does a judgment for past damages bar a later action for future damages?

6. Assuming that an award has been made only as to legally compensable items, do the courts have power to set aside a jury verdict which is grossly excessive?

1. WAS THERE ANY ACTUAL HARM?

Without reference to the legal compensability of a particular grievance, a good initial question to apply to all cases is this: can the patient show any actual harm arising from the alleged dereliction? If not, he can have no redress in an action for negligence and even for intentional invasion of some legal right of plaintiff no recovery save nominal damages (1 cent to \$1). He must both plead and prove actual damage before he can recover any substantial award.

The point is neatly illustrated in a Canadian case in which the plaintiff, Clarendon Smith, sued a physician in an action on the case for unskillfully and negligently treating his wife in childbirth (*Smith v. Carder* [Court of Queen's Bench, 1883] 11 Upper Canada Queen's Bench Reports, 76). On the trial, a jury had returned a verdict for plaintiff in the amount of £25; on appeal, the higher court held it was insupportable. Chief Justice Robinson said:

It is quite clear, we think, that the first count of this declaration lays no good cause of action, for it merely states negligence without averring that any injury or damage accrued to anyone from that negligence.

(The first count merely said that the defendant conducted himself in an ignorant, unskillful, negligent and improper manner in the delivery of the plaintiff's wife, not alleging any injury in particular.)

An action might as well be brought against the driver of a stage coach for negligence in letting the reins drop from his hand, or in not having his wheels well secured when the carriage, nevertheless, went safely to the journey's end, and no injury was suffered by any one.

This is a universal legal principle which fits all those cases in which an irate patient seeks to penalize a physician for alleged negligence that has caused no actual injury.

2. WAS THE HARM OF A KIND FOR WHICH THE LAW ALLOWS DAMAGES?

Suppose physician X negligently reduces the fractured femur of Y, a professional football player, so that an irreparable deformity results, with permanent shortening of the leg. As a result:

(1) Y has a deformed leg.

(2) Y is unable to play football during the coming season or engage in other gainful occupation, his loss of earnings amounting to \$4,000.

(3) Y undergoes unnecessary pain and suffering.

(4) Y incurs physician's fees, nursing expense, costs for roentgenograms and miscellaneous charges including hospital bills, totaling \$1,500, which he itemizes. He has to stay in the hospital six months longer than would have been necessary if he had been given proper care.

(5) Y's enforced stay in the hospital causes his fiancée, a wealthy Hollywood actress, to break her engagement because he no longer looks like Adonis.

(6) Y loses a \$1,000 commission on a large insurance policy covering the members of the team which he was about to sell to the club but which he failed to sell because another insurance agent intervened during his enforced absence.

(7) Y loses the pleasure of attending the Rose Bowl football game, which he would have given a thousand dollars to see since he was a graduate of the University of Tennessee, one of the participating teams.

(8) Y loses four new tires from his automobile by thievery occurring at his home at a time when, had proper treatment been applied, he would have been well and on the premises.

For which of these items of damage can Y recover judgment against physician X?

Liability in tort extends beyond the damages recoverable for breach of contract, which are confined to those in contemplation of the two parties at the time they made their agreement. Courts are also inclined to allow a wider range of recovery for wilful or malicious conduct than for mere negligence.⁶

Many courts hold, in respect to negligence, that to be compensable a harm must be of the general type which an average prudent person would reasonably have foreseen as likely to flow from his tortious act. Other courts reach substantially the same result by holding that damages will be allowed only if the harm is of a character falling within the risk which the actor's duty of care is intended to protect against.

The exact harm need not be foreseen nor the overwhelming probability of its occurrence. Foreseeability of a probable harm of such gravity as would impress a reasonable person with the negligence of the course of conduct causing it is enough.

Assuming proper proof, Y could recover for items 1 to 4 but not for items 5 to 8. The latter do not satisfy the requirements of foreseeability and so are held to represent "remote," rather than recoverable "direct," damage. More realistically, the latter constitute harms of a variety outside those which the law, as a matter of policy, feels X's duty of care should protect against. Each of the eight items referred to is an actual result of X's negligence, but tacitly involved, whether the courts openly face the problem or not, is the question: On whom should fall the risk of the particular loss? Intrinsically, the problem depends on equitable and social considerations; these in turn are given expression in definite rules of law as to "damages," to be uniformly applied to like transactions. A person is negligent toward another and therefore guilty of wrongful con-

duct only when a reasonably prudent person similarly situated would have foreseen that the proposed course of action threatened a likely harm of the same general variety as that which actually occurred. Thus, if the harm is of an obscure and extraordinary variety, ordinarily not flowing from such conduct, the danger of its occurrence could neither guide nor deter the action of a reasonably prudent man. In respect to such items of "harm," the law can reasonably say: "Here there is no adequate basis in culpability for casting the risk of loss on the actor." Even more emphatically may this be said when the actor, as in the case of the physician, is making a bona fide attempt to advance a social interest. Since the actor is thus free of fault, the rule applies that as between two innocent parties the risk of loss must lie where it falls.

Some courts achieve what they consider an equitable placement of this risk of loss by applying principles of proximate causation and holding items outside the normal type of damage to be "remote," rather than "proximate," results, and hence not compensable.

Certain other types of "harm" caused by negligent conduct are refused money compensation on quite different grounds. As an illustration, I cite the refusal of American courts generally to grant damages for "shock" or mental anguish when unaccompanied by actual injury. In such cases the courts disallow the claim, not because of its remoteness in expectation but because it is considered too speculative to permit of any fair mode of measurement. To permit a jury to enter variable verdicts, often on surmise, in the reparation of purely "subjective" harms opens, it is thought, too wide a door for fraud. It is, further, considered too radical a departure from the law's purpose of awarding money damages as actual compensation for harm capable of definite and certain measurement by objective standards.

3. EVEN THOUGH THE DEFENDANT WAS NEGLIGENT, DID HIS CONDUCT CAUSE THE DAMAGE OF WHICH THE PATIENT COMPLAINS?

This question of proximate causation arises typically in one of several different connections.

(1) Assuming full proof of all the actual facts, has requisite medical evidence been offered to show a causal connection between dereliction and damage? If not, no recoverable damage has been proved.

Example.—A was rendered unconscious in a serious collision and was taken to a station house, where he was examined by a police surgeon, X. The latter was told of the accident, but after examining A, he entered a diagnosis of alcoholism and negligently failed to send him to a nearby hospital for such procedures as roentgen examination and lumbar puncture. Subsequently A died, and his wife sued X. X was admittedly negligent, and the damage was sufficiently shown, but all the medical testimony showed that the wound was so serious that it could not be said A would have had a chance of recovery even with the best of care. The trial court granted the defendant's motion for an instructed verdict (*Ramberg v. Morgan* [Iowa Supreme Court], 1928, 209 Iowa 474, 218 N. W. 492). Affirmed.

In such a case nothing could be gained by a new trial, for the evidence has been fully developed. Consequently, the appellate would reverse any judgment

6. "The rule universally applied in awarding damages for breach of contract is that the plaintiff may recover such damages as may reasonably be supposed to have been in the contemplation of both parties at the time they made the contract, as the probable result of the breach of it. In the great majority of cases, the courts have refused to apply this rule in tort actions. When the wrongdoer acts wilfully or maliciously, the rule usually applied is that he is liable for all the direct results of his acts; and, when the wrongdoer is merely negligent, he is liable for all the natural and probable consequences of his act, or failure to act." *American Law Reports, Annotated*, New York, Edward O. Thompson Company, 1927, vol. 48, p. 318.

erroneously awarded to the plaintiff in the trial court and enter final judgment for the defendant.

(2) Suppose full proof has not been made but that the plaintiff's evidence raises a clear inference that all four elements (duty, dereliction, direct causation and damage) are present. It falls short in failing to show what part of the damage is due to the defendant's negligence and what part to the original injury.

Example.—A sustained a fracture of the hip and got a bad result through X's negligence in letting him get up without confirming recovery by roentgenograms. A, in his action for damages, does not show what the degree of functional disability and deformity would have been with proper treatment. The proof is too speculative to support a verdict in such case, for A cannot recover for that part of the disability which would flow from such an injury even with good medical care. He can hold X only for the additional disability and deformity occasioned by X's negligence. In meeting his burden of proof on damages, A must therefore provide the standard of measurement by showing through expert evidence what the probable degree of impairment would have been with good ("average") treatment administered by a physician of the same class (general practitioner or specialist, as the case might be). (*Moore v. Tremelling* [U. S. Circuit Court of Appeals, Idaho], 1935, 78 Fed. [2d] 821.)

In this case, if the plaintiff has secured a verdict and judgment in the trial court, the appeal court cannot properly allow it to stand. Yet it appears that a meritorious case probably exists on which the facts have not been fully developed. Appellate courts are disinclined to cut a party off for lack of diligence in making a technical proof if they feel the deficiency can be supplied. Hence in such cases they are not so apt to reverse and render the judgment (that is, to take the judgment from the plaintiff and make it final in favor of the defendant) as they are merely to reverse judgment and remand the cause to the trial court for a new trial. The plaintiff on retrial will often make good the deficiency pointed out to him and so prevail on the second trial.⁷

It is interesting that a different result may follow if the physician's counsel, as he should, promptly files a motion for an instructed verdict after both parties have finished offering their evidence in the trial court. Such motion challenges the right of the plaintiff to go to the jury; it says in effect: You have not made out the "prima facie" case which your burden of proof requires in respect to the four D's (duty, dereliction, direct causation and damage), for you have not brought forward definite and certain evidence of any "damage." The plaintiff has had his "day in court" and is not entitled to "two bites at the cherry"; therefore, the trial judge properly must grant the motion.

Unless the plaintiff in his subsequent motion for a new trial can show some (other) extraordinary ground for setting aside the verdict, such as newly discovered material evidence not ascertainable earlier by due diligence, the trial court will enter judgment for the defen-

dant, and the appeal court will affirm its action. That in courts of the same jurisdiction two opposite results on the same "actual" facts might thus occur affords revealing insight into the principles on which the present judicial system operates. First, the courts are "receivers" of evidence, not searchers for outside facts; second, cases are decided on "proved" facts, which may not be identical with the "actual" facts; third, every party is expected to show diligence in seeing that all "actual" facts in his favor are properly proved in court and fourth, many rulings on evidence are invoked only by the timely action of the affected party, whose failure of diligence may be controlling in regard to the final result of the litigation.

(3) What is the responsibility for injury when the defendant's negligent treatment results in the patient's shift to another physician, who in turn is negligent?

This situation presents a novel and important medico-legal question. In the first place, courts hold that when the first physician to treat a patient has been negligent it is not contributory negligence for the patient to decline further treatment by him, nor is the patient required to submit to mending or corrective procedures by one who has already caused damage by virtue of his negligent medical care.

Suppose that the patient carrying an injury inflicted by the initial physician places himself in the hands of a second physician. The original injury could be completely corrected by the second physician through the exercise of "average care," but instead he negligently omits to take indicated measures. The original injury persists and becomes more disabling by lapse of time. The patient sues the first physician for the total injury. The latter claims that the negligence of the second physician was a new and intervening cause serving to break the chain of proximate causation extending from the defendant's initial tort. He urges that at most he can be held only for such damages as would have ensued from the original negligent treatment had the patient subsequently procured competent medical attention.

This contention will not hold. The decisive question is whether the patient has done what the law requires of an injured person in taking reasonable steps to mitigate the original injury.

Most cases have arisen in respect to situations in which the original injury was inflicted not by a negligent physician but by the tort of another layman, for instance, in an automobile collision negligently caused by another motorist. The reasoning, however, is the same. In general, the courts hold that if an injured person exercises ordinary care in the selection of a physician or surgeon to treat his injury the original tortfeasor is responsible for damages occasioned by mistake or error in treatment or for failure to bring about a cure.

But if a wound is inflicted not dangerous of itself, and it is apparent that death was caused by the grossly erroneous treatment, the original wrongdoer will not be responsible for the death; however, where the wound inflicted is mortal, the wrongdoer cannot acquit his liability by a plea of erroneous treatment. (See *Lovless v. Red Top Cab Co.* [Wash. Supreme Court 1930] 158 Wash. 474, 291 Pac. 344, 79 A L R at p. 373.)

It will be observed that the question may arise (as indeed it has), in cases not against physicians at all, when a defendant who is indicted for the crime of murder seeks exoneration on the ground that the negligent treatment of a physician, rather than the original wound, caused the death in question.

7. This is precisely what occurred in *Moore v. Tremelling*, *supra*. The judgment first obtained was reversed by the appeal court for insufficiency of technical proofs. Evidently the higher court felt that the evidence disclosed a meritorious case on which the evidence was not all in; hence it did not exercise its undoubted right to reverse and render and thereby to enter a final judgment in favor of the defendant. On a second trial, the plaintiff made good the deficiencies in his proof pointed out by the appeal court's opinion. The judgment he obtained was again appealed but this time was affirmed by the Federal Circuit Court of Appeals in *Moore v. Tremelling* (C. C. A. Idaho, 1938, 100 Fed. (2d) 39).

The principles apply equally to civil litigation. In *Horney v. St. Louis & N. E. R. Co.* (1911), 165 Ill. App. 547, the decedent received an injury to his back and side in a negligent collision of two of the defendant's cars. Six weeks later he was found to have a ventral hernia. Two operations were performed without effecting cure, and the decedent died. The trial court charged the jury thus:

If you further find that, through some mistake of the said surgeons or of competent nurses and attendants, the infection resulted from and followed said operation, through no act of said Henry Horney, and thereafter said Henry Horney died on April 23, 1909, from said infection resulting from the wound made by said surgeons in said operation and the treatment thereof by the said surgeons and nurses, then the court instructs you that the said acts, mistakes or errors of the surgeons and nurses should be considered by you as a part of the immediate and direct result produced by the injuries received by the said Henry Horney in said collision.

The appeal court held that this charge was correct and that the jury verdict for the plaintiff was warranted by the evidence.

In *Caven v. Troy* (1897) 15 App. Div. 163, 44 N. Y. Supp. 244, evidence was offered to show that the decedent was improperly treated and that death otherwise would not have ensued. In reversing a judgment procured by the defendant, the appeal court said:

The deceased, after the injury by the negligence of the defendant, was bound in good faith to take reasonable care of herself. If she did so, although the physician or physicians who attended her did not use proper treatment, or neglected her, in consequence of which the injury caused by defendant's negligence terminated fatally, the plaintiff was entitled to recover.

The question of interruption of proximate causation by subsequent negligence of the second physician came before the Supreme Court of Germany in 1921 in an intriguing case.⁸ The facts were these: The plaintiff suffered a dislocation of his hip joint from a fall in the street. Physician X was called in and treated the pains as rheumatism of the knee, without diagnosing the dislocation. Fifty days later, the plaintiff quit X and went to Y, chief of the medical staff of a hospital. Y correctly diagnosed the dislocation by roentgen examination, but after an unsuccessful attempt to reduce it negligently limited treatment to massage, and the end result was a marked deformity. Thereupon, the plaintiff filed his suit against X, seeking to hold him for the end result. X, in turn, claimed that he was liable for only a small fraction of the injury, if at all; he stoutly maintained that the chain of proximate causation was broken by the subsequent negligence of Y. The intermediate appeal court of Hamm sustained this contention and held that X was liable for only part of the injury. The Supreme Court of Germany, however, overturned this ruling and held that X was liable for the entire end result; Y's conduct would break the chain of proximate causation only if it was so extreme as to constitute gross negligence.

I have not seen an actual American or English case with this fact situation, but there is every reason to believe that both English and American courts would arrive at the same result.

Thus, if a physician feels he has been negligent in the treatment of a patient whose disorder has proved to require more skill than he possesses, he should not

rejoice at seeing the patient go from his care into unknown hands. He will do well to steer the patient, if possible, into the hands of a thoroughly competent acquaintance.

4. WHAT ARE THE PRINCIPLES ON WHICH THE COURT MIGHT PERMIT AN AWARD OF DAMAGES?

Three distinct classes of damages are recognized by the courts: nominal, compensatory and punitive.

Nominal Damages (1 cent to \$1).—The doctrine of nominal damages has had an interesting judicial history. At common law, an intentional assault on another's person, a trespass on his land or interference with his rightful possession of personal property was a breach of the peace and so a wrong to the state.⁹ The rule thus arose that a plaintiff, in respect to such acts, could recover nominal damages without proof of actual damages. Quite a different rule obtained in respect to negligence. In actions on the case for negligence, it was held that actual damages must be proved by a litigant to make out any right of recovery. This distinction was sound in logic, for when one intentionally commits a trespass, as, for instance, a battery against another, he thereby invades an existing legal right of personality. But in the case of negligence, the law does not recognize a legal right in the plaintiff except to be free from negligent acts of another which do him actual harm: no damage, no wrong. The rule as to trespass has been followed by modern courts. Thus, in *Parker v. Kirkpatrick*, 1924, 124 Me. 181, 126 A. 825, the plaintiff sued the defendant, an employee of a store, who, suspecting her of shoplifting, questioned her and then put his hand in her pocket and found only an empty rouge box. Since no actual damages were proved, nominal damages were allowed. The same rule holds for breach of contract.

On the other hand, the modern decisions show a split of authority as to whether a trial court can award nominal damages to a plaintiff in negligence cases in which all elements of liability have been proved except actual damage. At common law, the prevailing party, even though he was awarded only nominal damages, could recover costs of court against the other litigant.¹⁰ In modern England,¹¹ in the federal courts of the United States¹² and in two thirds of the American states¹³ this rule has been changed materially. Also, it is now the better view that even nominal damages should not be awarded in negligence cases in the absence of proof of actual damage.

Compensatory Damages.—These are the substantial damages granted to compensate actual loss or injury. It has been held the jury may consider, when properly in evidence before them: (1) physicians' or surgeons' fees, nursing expense, cost of drugs, medicines, roentgenograms and the like rendered necessary by the defendant physician's dereliction, but excluding such items as were necessitated by the original sickness or injury (the burden is on plaintiff to separate the two); (2) value of the loss of time caused by the defendant's

9. Street, T. A.: *Foundations of Legal Liability*, New York, Edward Thompson Company, 1906, vol. 3, chap. 17.

10. Holdsworth, W. S.: *History of English Law*, Boston, Little, Brown & Co., 1924, vol. 4, p. 536.

11. 53 and 54 Vict. c. 44 (5); 51 and 52 Vict. c. 43 §§ 116 and 117.

12. 28 U. S. C. A. § 815.

13. McCormick, C. T.: *Handbook on the Law of Damages*, St. Paul, West Publishing Company, 1935, p. 94.

8. Decision of German Supreme Court in Civil Litigation, June 3, 1921, vol. 102, p. 230.

dereliction; (3) physical and mental pain and suffering directly resulting, and (4) when the injury is shown to be permanent, the effect on the plaintiff's earning capacity in the future and future pain and suffering, both physical and mental.

Punitive or Exemplary Damages.—The grant of punitive damages represents an anomalous doctrine of the American common law. By this means a civil court grants a quasipenal remedy by way of punishing and deterring a dereliction colored by fraud, malice or gross negligence of a shocking variety. The jury is given a wide latitude regarding the proper amount to award as punishment. Exemplary damages cannot be awarded when there has been no proof of actual damage. Punitive damages are really foreign to the concept of exact compensation on which tort law is bottomed, but in only a handful of malpractice cases of flagrant character has the remedy been sought or granted.

Example: A leading case on the subject is that of *Brooke v. Clarke* (Texas Supreme Court), 57 Texas 105, in which a physician ligatured a child's penis instead of the umbilical cord, causing the entire glans penis to come off. His defense was that Mrs. C., a neighbor, must have handed him the wrong thing to tie. A jury awarded punitive damages of \$5,500. In affirming the judgment, Justice Gould said:

The criminal indifference of the defendant to results was a fact which the jury were at liberty to infer from the gross mistake which he either made or permitted to be made, and the grievous injury which was liable to result and did result therefrom. If there was other evidence tending to negative any wrong intent or actual indifference on his part, still the existence or non-existence of such criminal indifference was a question of fact for the jury, and was rightly submitted to them. If the conduct of the defendant in the discharge of his duty as accoucheur was so grossly negligent as to raise the presumption of his criminal indifference to results, we very greatly doubt whether it should avail to exempt him from exemplary damages for him to show that he had no bad motive, and that he acted otherwise in a manner tending to show that he was not at heart, indifferent. Where the act is so grossly negligent as to raise the presumption of indifference, evidence that in other matters connected therewith he had shown due care, and that actual indifference would have been in fact indifference to his own interest should, we think, not be allowed for any other purpose than to be considered by the jury in fixing the amount of exemplary damages.

5. DOES A JUDGMENT FOR PAST DAMAGES BAR A LATER ACTION FOR FUTURE DAMAGES?

The answer is, generally, yes, for the patient is bound to assert his entire claim in a single suit (*Howell v. Goodrich*, 69 Ill. 556). This rule applies to all accrued damages, that is, damages already sustained together with all future damages and disabilities capable of proper proof, these latter being discounted to their present value.

6. ASSUMING THAT AN AWARD HAS BEEN MADE ONLY AS TO LEGALLY COMPENSABLE ITEMS, DO THE COURTS HAVE POWER TO SET ASIDE A JURY VERDICT WHICH IS GROSSLY EXCESSIVE?

The answer is yes. The decisions hold that this discretionary power of trial judges should not be exercised to set aside the award and grant a new trial unless it is "so grossly excessive as to show that it was actuated by passion, prejudice or partiality or was

based on some mistake as to the law or the facts." The appellate courts have the power of reviewing an abuse of this discretion when excessiveness of the verdict is made the subject of appeal. If the appellate court concludes that the damages awarded are indeed excessive, it will often specify the maximum sum which could be called reasonable and affirm the judgment on condition that the plaintiff files a remittitur (waiver) of the excess. To accomplish this, the court enters an order which in substance provides:

Judgment for plaintiff as entered below, is hereby reversed and the cause remanded for a new trial, except in event plaintiff files a remittitur of \$— in the trial court within thirty days of date, in which event judgment for the balance of \$— is hereby affirmed.

Thus, in *Hoffman v. Watkins* (Supreme Court of Washington), 1916, 89 Wash. 661, 155 Pac. 159, plaintiff had recovered \$4,000 for an injury to the shoulder which disenabled lifting above the level of his shoulder. The joint was otherwise unimpaired, the shoulder was no longer causing pain and the plaintiff's earning capacity was not materially diminished. It was true that he had suffered much pain, inconvenience and considerable expense as a result of the defendant's negligence. The Supreme Court held the verdict excessive and affirmed the judgment on condition that the plaintiff file a remittitur for \$1,600 within thirty days, failing which a new trial was to be awarded.

A solution of formaldehyde was inadvertently injected in lieu of procaine hydrochloride as an anesthetic for an operation involving removal of a cyst in the pelvic region. The patient suffered pain for about three months and alleged that the scar produced interfered with marital relations by causing pain in sexual intercourse. She recovered \$12,500 in the trial court, a sum held, on appeal, to be excessive by \$5,000 (*Hallinan v. Prindle* [Cal. App.] 62 Pac. (2d) 1075).

It is not the province of this paper to consider what awards courts of the several states have held to be excessive for different injuries. The intent of the foregoing sections is to point out the existence of a mechanism through which overgenerosity of a jury can be partially corrected and excessive awards pared down.

MECHANICS OF THE JUDICIAL PROCESS

I have endeavored to present a new approach to the problems of medical malpractice. If the rationale put forward enables the physician to hold the four controlling strings of "duty, dereliction, direct causation and damage" in his hands in place of myriads of tangled skeins, it meets its aim. If, admittedly, he is not yet at "omega," still he is respectably beyond "alpha" in understanding the problems of medical malpractice.

To progress further toward "omega," one must accept the challenge of the law in action. How does a case find its way into the courts, and what is the chronicle of its course as it proceeds to ultimate disposition? Although I recognize that specific procedures vary somewhat from state to state, I believe the following résumé will nevertheless afford an insight into the essential mechanics of the judicial process in all jurisdictions.

Initiation of an Action at Law; Service of Process and Filing of Pleadings.—Briefly, any aggrieved person, with or without cause, can file an action at law. He is the plaintiff, and the person sued is the defendant.

When the tort was committed jointly by several, he may join them all as parties defendant. The action is necessarily based on a pleading, called a "complaint," a "declaration" or a "petition," according to the legal usages of the particular state. This pleading sets forth the essential facts constituting the plaintiff's grievance or cause of action against the defendant. It is not to contain mere "legal conclusions" nor yet a statement of plaintiff's detailed evidence but rather the ultimate facts on which he relies.

A certified copy of this pleading is served on the named defendant within the jurisdiction in which the acting sheriff or constable holds office. This will be confined to his county. Furthermore, since a public officer of one state is a mere private citizen of any other, if he crosses into a sister state to effect personal service, his action is null and void, and any personal judgment entered on such service is likewise null and void and subject to either direct or collateral attack. If the defendant cannot be found in the jurisdiction, except in the exceptional cases, not applicable to the problem postulated, in which constructive service is given credit, the plaintiff must file his "personal" action in the jurisdiction in which he can find and serve the defendant. Service of a summons by a private person when in conformance with the law is as valid as if effected by a sheriff.

If it is assumed that there has been a valid service of process, the defendant physician will find set out in the body of the citation the "appearance day," several days to weeks removed, by which he must file an answer or suffer judgment by default. A well informed defendant, in filing answer, will observe the "due order of pleading" since "dilatory pleas," such as pleas in abatement, must be filed preceding pleas to the merits or else they are waived. Subject to his dilatory pleas and after them, defendant pleads in his answer, to be filed before appearance day, a general demurrer and general denial. By timely amendment before trial, he adds any affirmative defenses he has to offer. As I have explained, the office of the general demurrer is to admit, only for purposes of testing their legal sufficiency, the allegations of fact contained in the plaintiff's petition. The demurrer in effect says: Admitting for the moment that all the facts you have pleaded are true, you still have set forth no grounds for recovery in law. If the demurrer is sustained, the plaintiff must amend by pleading further until he does state a cause of action, failing which he will not be permitted to go to trial, and his suit will be dismissed. By a like mechanism, plaintiff can test out the sufficiency of any affirmative defenses the defendant may have filed. By appropriate motions to make definite and certain or by special exceptions pointing out deficiencies, the parties can require fuller elaboration of obscure allegations. Rules of pleading are intended to enable each party, in advance of trial, to learn the major contentions, though not the exact evidence, the other will rely on. The affected party is thereby insured due opportunity to prepare his legal position, muster his evidence and arm himself for his opponent's thrusts.

Pleadings thus put the parties "at issue" on opposed contentions and minimize surprise in the law's effort to give the litigants a fair "day in court." A party cannot prove what he has laid no foundation for in his pleadings.

Fundamentals of Trial; Functions of Judge and Jury.—At a varying interval after appearance day ("answer day"), the case is set down for trial. Either side by proper demand can exercise its right to trial by jury of all disputed facts. By mutual waiver of jury trial, either expressly or impliedly by mere failure to request a jury, the right can be conferred on the trial court to act as trier of facts as well as of law.

In selecting the jury, an initial panel of twenty-four men is brought into open court. Respective counsel have the right to question each member of the panel individually.

Any number of jurors can be "challenged for cause," as when they are shown to have formed an opinion in advance or to have a prejudice against the case or the type of litigation or one of the parties or are found to be related to one of the litigants. If the trial judge is of the opinion, after hearing the examination and questioning the prospective juror, that some fact exists which would prevent his passing on the testimony impartially, the court is required to dismiss him from the panel. Usually each litigant also has three to six peremptory challenges, enabling him to strike this number of prospective jurors from the list without assigning cause. The remaining twelve jurors, not eliminated, constitute the jury. It is their province to determine fact issues as submitted in the court's charge at the conclusion of the case after argument of counsel. In many states, questions are submitted seriatim:

Do you find from a preponderance of the evidence (as that phrase has been defined herein) that on Aug. 15, 1937 Dr. X attended the plaintiff as her physician? Answer yes or no, as you find the case to be. Answer———.¹⁴

Jurors must not indulge in improper conduct during the trial or during their subsequent deliberations.

The trial judge has several important functions, among which are: (1) setting the case for trial and passing on motions for continuances etc.; (2) enforcing rules and order of court; (3) passing on pleadings; (4) ruling on admissibility of evidence and questions of law; (5) at the conclusion of the testimony, preparing a charge for the jury, submitting to them such disputed questions of fact as have been raised by the evidence (he introduces into the charge such definitions and instruction as the jury is apt to need in its deliberations); (6) passing on the legal effect of the answers ("findings of fact") contained in the jury verdict; (7) entering judgment for the entitled party after hearing any argument of counsel; (8) hearing motions for a new trial, and (9) reading the record prepared for appeal with a view to verifying the accuracy of the "statement of facts," which contains the transcript of testimony prepared by the court reporter, and the accuracy of the "transcript," which contains such material as copies of the pleadings, orders of the court, motions and the judgment entered in the case.

It is a cardinal principle of trial law that whenever evidence is offered which is believed to be inadmissible the burden lies on the offended party to offer timely objection. Rules of evidence are not self executing, and once testimony is in without protest the objection is waived. In like manner, a duty of diligence rests on

14. Most states still use the "general verdict" system, under which the jury is elaborately charged by the court after the close of testimony and brings in a verdict for the plaintiff or for the defendant without answering minute questions in their deliberations.

the affected party to file his motion for an instructed verdict if he believes at the conclusion of the evidence that his opponent has not met his burden of proof by "prima facie" evidence. By "prima facie" evidence is meant the minimal amount necessary to warrant a reasonable man's entering a finding of fact on it. If the trial judge has such a motion for an instructed verdict presented to him in due time, a question of law is raised for his decision, namely, the sufficiency of the evidence to make out a "prima facie" case and thereby the right of the affected litigant to go to the jury. It would be supererogation to permit a jury to enter a verdict on evidence so insubstantial that the court would be required to set it aside and grant a new trial or enter judgment for the opposing party notwithstanding the verdict ("non obstante veredicto"). Whenever a trial court grants a motion for an instructed verdict, the effect necessarily is to take the case from the jury.

In event a bona fide dispute of fact is present, this conflict in the evidence makes a case entitled to go to the jury. It must be remembered that it is the special province of the jury to resolve such conflicts by deciding what the facts actually are. This function carries with it the right to judge the credibility of the witnesses and to pass on the weight to be given their testimony. Considerable acrimony on the part of litigants often arises from exercise by the jury of its right to prefer one version and to reject another. Trial lawyers recognize that a jury legitimately can find a fact to be true from "a preponderance of the evidence" even though it is supported by the testimony of only one witness against the combined testimony of several opposing witnesses. One truth teller is worth several liars; one careful spectator is more to be trusted than a multitude of inefficient observers. Who is the truthful man and what is the qualification of the witness and his lack of bias the jury is entitled to decide.

In their closing arguments to the jury, counsel must not "go outside the record" to argue on facts not in evidence, and they must not indulge in inflammatory, prejudicial argument. Thus, it is a reversible error to comment on the fact that a defendant is protected by insurance or to compare the impecunious condition of a plaintiff with the "gigantic wealth of a selfish corporation" defendant. Such arguments defeat the guarantee of impartial, fair trial and if properly objected to afford ground for reversal in the appeal court. Many a hard won verdict has been taken from plaintiff and the case remanded for new trial because of injudicious inflammatory remarks to the jury.

The jury, too, must confine its deliberations to matters in evidence. To argue in the jury room that "Dr. X must be negligent because that's the very sort of thing Dr. Y did with my cousin Nelly when she lost her baby" or any other misconduct of the jury is basis for a new trial in the lower court or reversal on appeal. However, in the interest of finality, the testimony of jurors themselves in most cases is not admissible to show their own misconduct, the common law rule being that a juror cannot impeach his own verdict.

Once the jury has returned its verdict into open court, it devolves on the trial judge to study the fact findings disclosed therein, to hear any argument of counsel as to their legal effect and to enter judgment on the merits in favor of the entitled party.

RIGHT OF APPEAL

Either party may appeal from an adverse judgment by conforming to the pertinent statutory provisions which will be found in each state to regulate the right and to prescribe the steps to be taken. Appeals may be carried to intermediate courts as a matter of right in most states, but to the state supreme court only in the latter's discretion. An appeal court does not receive additional fact testimony on the merits. It looks for its facts and for the sufficiency of their proof to the verbatim record of evidence taken down by the court reporter in the trial court. The appeal court passes only on disputed questions of law.

Sometimes a malpractice plaintiff can make the case turn on a question of "lay" fact, provable by nonexperts: in such cases a defendant is vulnerable. More often the proof of duty, dereliction, direct causation and damage will involve facts about medical practices which can be elicited only from qualified experts. Such experts are interrogated largely by hypothetical questions.

In the latter, and more common type of malpractice case, it is the plaintiff who is apt to be vulnerable, for he carries a heavy burden in making proof of his "prima facie" case.

Familiarity with the four d's will enable one to expose the fatal weaknesses in many claims put forward. The physician should make it a habit to keep records, even if brief, of all his transactions, for they carry great evidentiary weight with a jury. One is entitled to offer properly kept records in evidence. Even if a jotted memorandum of a call or an incident is too informal to be received in evidence as a record made in the course of business, it has valuable uses. Provided it was made at or about the time the transaction occurred and at that time was known to be correct, it may be used to refresh the memory. In such circumstances, again, the jury is apt to consider the supported memory more trustworthy.

BURDEN OF PROOF IN MALPRACTICE ACTIONS

The plaintiff has the burden of proof on the four d's (duty, dereliction, direct causation and damage), and when he has finished his evidence, the physician should file a motion for an instructed verdict.¹⁵

Under a mere "general denial" of the plaintiff's allegations, without further pleading, a malpractice defendant can prove any facts which rebut the existence of one of the "four d's." If, on the other hand, the physician wishes to rely on such affirmative defenses as contributory negligence, assumption of risk (where applicable), the statute of limitations, prior compromise or prior adjudication ("res adjudicata"), the burden rests on him to plead these contentions and to prove them by a preponderance of the evidence. On such affirmative defenses, the defendant has precisely the burden of the plaintiff in producing a sufficient quantum of evidence to constitute "prima facie" proof. If he falls short, he is not entitled to go to the jury on these defenses and is in danger of having a verdict instructed against him.

The specific precautions for the physician to take, the availability of affirmative defenses and the strategy of trial are all subjects which can be elucidated with full effect only after the physician has gained the initial background which these papers have endeavored to supply.

15. It should be recognized, however, that malpractice need not be proved by direct and positive evidence but can be proved by a chain of circumstances from which the ultimate facts required to be established are reasonably and naturally inferable (*Gross v. Partlow* [Washington Supreme Court] 1937, 190 Wash. 489, 68 Pac. [2nd] 1934).

SUMMARY AND CONCLUSION
(PAPERS I TO VI)

In article I, "The Legal Matrix of Medical Malpractice," I sought to trace the evolution of medical responsibility before the law. I was able to show a transition from absolute liability, without fault, in ancient times to the modern notion of limited responsibility based on culpability.

In article II, "Something of the Anatomy of the Law," I presented a comparative analysis of "judge-made law," under the headings of "civil common law," "criminal common law" and "equity." I endeavored to show what bearing, if any, each of the three has on the law of malpractice. An interpretation of common law, its strengths and its weaknesses, was proffered the reader. Other sources of legal materials were noted. It was my hope in this article to orientate the reader on the main sources of modern law.

In article III, "Forgotten Ancestors of the American Law of Malpractice," I selected at random one of the latest and most important American decisions on malpractice and showed how it could be traced back to English progenitors. A survey was made of the earliest origins of the modern English law of medical malpractice from which have sprung the American common law doctrines.

In article IV, "Growth of the American Common Law of Malpractice and a Proposed Formula for Testing the Legal Sufficiency of Malpractice Claims," I traced by ten year periods, from 1790 to 1940, in each state, the incidence of medical civil malpractice appeal cases. I presented statistical indexes for the ten year period 1930 to 1940, to make possible comparison of the material on medical malpractice appeal cases in the several states. Interpretations of the statistical data were offered. I proposed a universal formula, applicable to all malpractice claims, which consists of "duty + dereliction + direct causation + damage," and I showed that a malpractice plaintiff must establish the concurrent existence of all four components in order to make out a "prima facie" case entitling him to go to the jury. Failing to do so, in any particular, he is subject to having a verdict instructed against him in the trial court on timely motion of the defendant.

In article V, "Further About Duty and Dereliction," I unfolded the telescoped concepts of the formula previously offered.

In article VI, "Further About Direct Causation and Damage," it was my intent to give fundamental principles which radiate from these two terms of the formula. In this paper I also offered an abbreviated account of how a case gets into court and progresses to its ultimate disposition.

Throughout the successive papers, I have purposely indulged in a certain amount of repetition so that the fundamental legal concepts involved could be grasped more easily.

I have sought intentionally for a new rationale of malpractice which the physician might find useful. These studies, therefore, constitute a skeleton of thought rather than a catalogue of legal cases.

In seeking to show the legal evolution and magnitude of the malpractice problem and its amenability to a single controlling formula, one must not let orientation become overvoluminous. Like Bulstrode, in his preface to the opinions of Coke, published in 1657, I say: ". . . And now, my Lords, it is time for me to end, lest I should make the Porch too bigg for the House."

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

SPERTI IRRADIATION LAMP MODEL
HI-41 ACCEPTABLE

Manufacturer: Sperti Electric Manufacturing Corporation, Beech and Kenilworth avenues, Cincinnati.

The Sperti Irradiation Lamp, Model HI-41, is described by the firm as a "Super-Tan Ultraviolet Lamp." The source of radiation is a mercury arc burner mounted in a cylindrical reflector. An adjustable metal stand supports the burner and reflector. The lamp operates on alternating or direct current.

The firm submitted the following data concerning the physical characteristics of the lamp:

	Microwatts per Square Centimeter
Ultraviolet, including line at 4,047 angstroms.....	462
Visible, including 4,358 (blue), 5,461 (green), 5,770-5,790 (yellow) and 6,907 (red).....	232
Near infra-red, lines near 1 micron.....	53
Infra-red, beyond 1.4 microns.....	13,313
Total	14,060

RADIATION IN INDIVIDUAL LINES

One tube floor lamp, 15 inches from receiver. No filter.

Wavelengths in Angstroms	Microwatts per Square Centimeter
2,483	+
2,536	312
2,652	+
2,803	+
3,022	6
3,132	47
3,342	+
3,650, 54, 62.....	52
4,047	46
4,358	103
5,460 (5770, 5790)	102
6,907	27
10,140	36
11,287	17

(+ indicates trace)

TOTAL RADIATION¹

In the Council's investigation of the lamp, the relative spectral intensities were found to be in fair agreement with the measurements reported by the firm's investigator. The total intensity of the ultraviolet radiation of wavelengths 3,132 angstroms and shorter was 187 microwatts per square centimeter at a distance of 24 inches (61 cm.) from the front edge of the reflector. Although this is only about one-half the value reported by the firm, it is nine times the minimum value required by the Council for acceptance as a sunlamp.

No radiation of wavelengths shorter than 2,804 angstroms was observed in the lamp examined by the firm's investigator. In the lamp examined by the Council, a trace of wavelengths 2,537 and 2,650 angstroms was observed, but it fell within the limits of tolerance for acceptance. Nevertheless it indicates the importance of controlling the thickness of the glass tubing used in making such lamps.

The radiometric measurements were supplemented by an erythema test, the observed time of exposure for a minimum



Sperti Irradiation Lamp, Model HI-41.

1. The data on total radiation were obtained by means of a suitable arrangement of a surface thermopile joined through a resistance to a ballistic galvanometer. This circuit was calibrated against a standardized carbon filament lamp. The data on the intensity of individual lines were obtained by means of a quartz spectrometer filter with a linear thermopile and a suitable amplifier. The data have been corrected for losses of reflection and absorption within the optical path.

perceptible erythema being closely the value calculated from the radiometric measurements.

In the erythema test, exposures of two, five, seven, ten, fourteen, seventeen and twenty minutes were made on the untanned inner forearm at a distance of 24 inches from the lamp (front edge of the reflector). Within an hour the twenty minute exposure appeared red, indicating overexposure. Within three hours all the exposures of seven minutes and longer appeared red, the seven minute exposure being very faint and disappearing shortly thereafter. The ten minute exposure was considered the minimum perceptible erythema, indicating a good performance of the lamp in ultraviolet emission.

The Council voted to accept the Sperti Irradiation Lamp, Model HI-41, for inclusion on its list of accepted devices.

Council on Industrial Health

MEDICAL SERVICE IN INDUSTRY

THE COUNCIL ON INDUSTRIAL HEALTH HAS APPROVED THIS ARTICLE AS ONE OF A SERIES ON MEDICAL SERVICE IN INDUSTRY WHICH WILL APPEAR FROM TIME TO TIME IN THE JOURNAL. MUCH OF THE MATERIAL ON CONSTRUCTION AND EQUIPMENT OF MEDICAL DEPARTMENTS IN SMALL INDUSTRIES HAS BEEN SUGGESTED BY DR. GLENN S. EVERTS OF PHILADELPHIA. THE FLOOR PLANS FOR USE BY LARGER CONCERNS HAVE BEEN CONTRIBUTED BY DR. C. F. N. SCHRAM, TENNESSEE EASTMAN CORPORATION, KINGSFORD, TENN.

C. M. PETERSON, Secretary.

THE INDUSTRIAL MEDICAL DEPARTMENT

QUARTERS AND EQUIPMENT

No physician will make appreciable reductions in the frequency and severity of illness and accidents causing lost time in industry unless he properly emphasizes preventive industrial medicine and surgery. The effective application of preventive medicine and surgery in industry rests squarely on intimate

Check List of Equipment for a Small Plant Dispensary

A. General furnishings

Sink
Instrument cabinet
Sterilizer
Dressing table
Leg rest
Cot
Stretcher
Mirror 10" X 12"

Foot pedal waste can
Waste basket
First aid kits
Storage cabinets
Paper towel rack
Adhesive rack
Record file
Scale

B. Instruments and supplies

Scalpels
Splinter forceps
Tissue forceps
Hemostatic forceps
Bandage scissors
Iris scissors
Surgical scissors
Loupe
Head mirror
Hand magnifying glass
Syringes
Assorted hypodermic needles
Assorted surgeons' needles
Needle holder

Assorted bandages
Adhesive plaster
Cotton
Assorted gauze dressings
Assorted sutures
Assorted splints
Assorted catheters
Assorted jars and basins
Test tubes
Safety razor and blades
Hot water bottle
Ice cap
Crutches
Tourniquet

C. Physical examination equipment

Stethoscope
Blood pressure apparatus
Thermometer
Otoscope
Ophthalmoscope
Nose and ear speculums
Laryngeal mirror
Spotlight
Tongue depressors
Snellen vision chart

Hemoglobinometer
Wassermann tubes
Microscope
Simple urine testing outfit
Centrifuge
Dynamometer
Tuning fork
Reflex hammer
Flesh pencil
Rubber gloves and finger cots

suggests that an organized medical service located directly in the working environment is the best single method for developing this kind of medical supervision. In addition, it represents convenience, economy of operation and efficiency to the workman, employer and medical department personnel as well, especially where good correlation must exist between the medical service and the safety, personnel and employment departments.

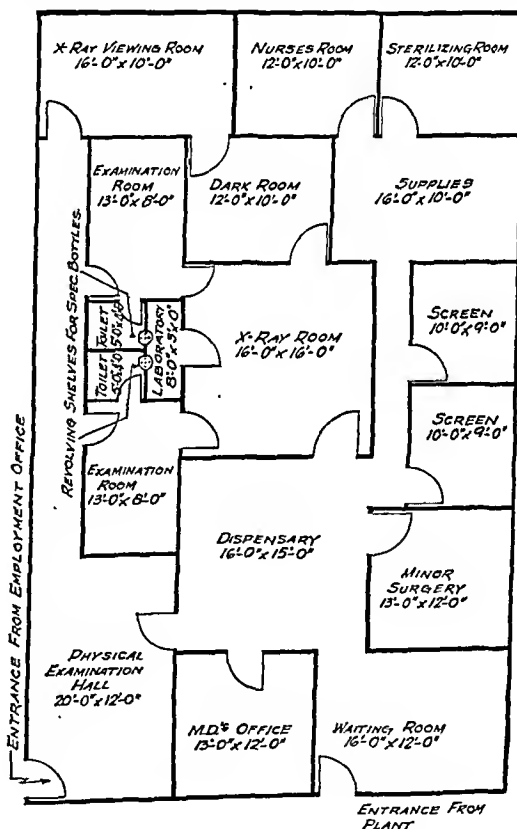
LOCATION OF PLANT MEDICAL DEPARTMENT

Location of the medical department in an industrial establishment will depend on the following considerations:

1. Access to natural light and ventilation.
2. Freedom from noise and vibration.
3. Accessibility to the greatest number of workmen.
4. Allowance for expansion.

SIZE OF LAYOUT

Good industrial medicine can be practiced in any location in the plant that can be kept clean and that provides privacy. However, repeated experience indicates that the medical unit commands respect only if careful attention is paid to suitable and efficient housing, appearance and equipment. A space 12 by 20 feet is recommended as a basic unit, divided into two



Plan 1.

rooms, one a little larger for general use. The smaller room can conveniently be set up as a center for physical examinations, record room and physician's office. Partitions should insure complete privacy. Some authorities recommend that space for a waiting room be included as a basic requirement, a need which becomes more apparent in the larger plant. The entire unit should be painted in light colors and kept spotlessly clean. The dispensary should be adequately heated. Proximity to toilet facilities is a great convenience. Suitable provision should be made for men and women if both are employed.

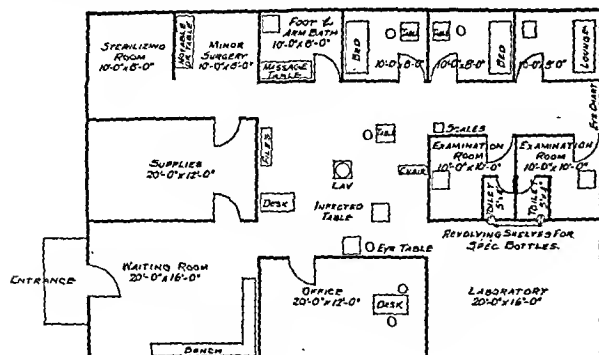
Permanent installations should include a sink with hot and cold water connections. It has been found convenient to have the sink provided with a suitable drainboard over which brackets may be placed to support sterilizing equipment. Preliminary

acquaintance with working conditions, processes, materials and men. The physician obtains such knowledge only by thorough and regular inspection of the plant. Although not strictly essential, practical experience in industrial units of all sizes

planning should dictate the placement of electrical outlets for lamps and other special equipment. Good overhead general lighting should be installed.

EQUIPMENT

The plant physician should, whenever possible, select his own equipment and supplies. Because of hard usage, good quality

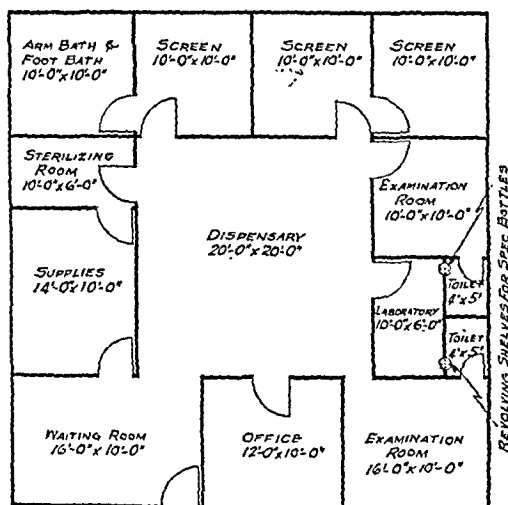


Plan 2.

is essential. Supplies need be neither large nor expensive. The accompanying check list of furnishings, apparatus and supplies has been suggested as a guide to reasonably complete equipment for a small plant dispensary. Additions or substitutes will depend mainly on the character of demands made on the medical department and on the personal predilections of the physician.

REQUIREMENTS IN THE LARGER PLANT

The requirements of a medical department in larger industrial establishments can ordinarily be satisfied by increasing the size of the basic units or by multiplying their number. No universally applicable formula has been devised from which it is possible to relate the necessary space or equipment to the number of workmen employed. As a rule, elaborate installations are seldom justified, especially if competent and approved hospital, laboratory and other consulting services are conveniently available. No major equipment or service should be installed without benefit of special advice in order that competent con-

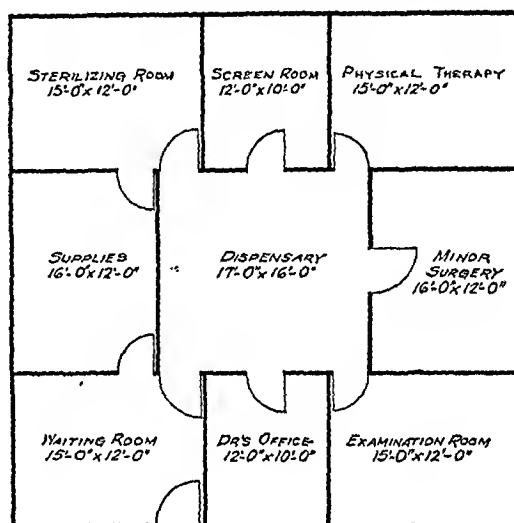


Plan 3.

The floor plans presented here are intended for industries of substantial size. All have features in common. Each has a central dispensary and waiting room. Screen rooms are provided for dressings or other procedures which require strict privacy. Supply rooms are intentionally commodious since they can never be too large. Each plan also provides a minor surgery, a sterilizing room and a physician's office.

The first plan represents an industrial medical department large enough to take care of 5,000 employees in an ordinary industry, the service to include preemployment and periodic physical examinations as well as dispensary work. In this arrangement, rooms for physical examinations are separated from the dispensary proper, but this disposition allows use of the same personnel. The x-ray room in this plan is central to both the physical examination suite and the dispensary. The room for viewing roentgenograms is sufficiently large for films and is readily accessible to the physical examination rooms.

The second plan represents an arrangement adapted to a medical department in a factory employing 2,500 people, of which 800 are women. The department is designed primarily for dispensary service but is adaptable for examinations as well. A long wide hall between screen rooms and examina-



Plan 4.

tion rooms is useful for testing vision. In this plan a toxicologic laboratory has been incorporated. General equipment has been localized.

The third plan is a more compact arrangement, emphasizing dispensary service and minor surgery. One side of the dispensary can be used for 20-foot vision testing.

The fourth plan is a modification of plan 3 and is designed for dispensary service only. This disposition of rooms and equipment is recommended because of compactness and consequent saving of steps.

COST OF CONSTRUCTION AND EQUIPMENT

Industrial medical departments in small plants have been constructed and equipped for as little as \$150. More commonly, expenditures of \$350 and up are necessary for suitable space and facilities. No estimate can be supplied about the cost of large industrial medical departments.

The First Writer on Psychology.—In the period 25 B. C. to 50 A. D., Aurelius Cornelius Selsus, who was not a physician but a scholar and an observer, enters the picture of psychiatry. He was a recorder of medical thought in Roman times of the rulers Tiberius, Caesar, and Caligula; his writings were of encyclopedic dimensions with sections on nervous disorders and an exposition of the known types of insanity. He has been called the first writer on psychology as such.—Lewis, Nolan D. C.: *A Short History of Psychiatric Achievement*, New York, W. W. Norton & Co., Inc., 1941.

sideration be given such factors as expectable use, space requirements, convenient arrangement and employment of necessary, qualified personnel.

There are a few other factors which must be considered in locating the medical department in a large plant. It is frequently desirable to place the unit as near as possible to the employment and safety offices. A ground floor site is indispensable unless elevator service is available in the building.

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SATURDAY, JULY 5, 1941

ANCIENT PROPAGANDA AGAINST ANIMAL EXPERIMENTATION REVIVED

Recently some of the newspapers in the Hearst chain have featured a column entitled "In the News"—written, it is understood, by Mr. William Randolph Hearst himself—which was devoted largely to propaganda against animal experimentation. Most of the material was a quotation from a speech by Dr. Walter R. Hadwen, who is referred to as a "leader in his honorable profession." Actually this speech was made in Los Angeles on June 16, 1921, more than twenty years ago. Hadwen was then the president and secretary of the British Association for the Abolition of Vivisection. He had published a pamphlet on "The Anti-toxin Treatment of Diphtheria," in which the opening sentence read "The Anti-Vivisectional interest attaching to the question of the use of Diphtheria Anti-Toxin serum lies in the fact that cruelty of a grave character is practiced, mainly upon horses, in order to obtain this particular nostrum." Think of the type of intellect that would refer to antitoxin against diphtheria as a nostrum! If there is any one fact fully established and fully accepted by every reasonable person today, it is the efficacy of antitoxin against diphtheria. Associated with the statement by Hadwen, which it is understood was made available to Mr. Hearst through the courtesy of one George Starr White, were a number of pictures purporting to illustrate tortures perpetrated on animals in the name of experimental medicine, accompanied also by quotations from the same George Starr White in which he describes scenes in a New York laboratory. Here are the facts about George Starr White, taken from "Fads and Quackery in Healing":

Whenever the irregulars in the healing art assemble for the purpose of exchanging trade secrets and telling each other how good they are, George Starr White, M.D., F.S.Sc. (Lond.), D.C., Ph.D., LL.D., Los Angeles, is among those present. He was "second vice president" of the Allied Medical Associations in 1918. He is also opposed to vaccination and helps out the American Medical Liberty League. White was graduated from the New York Homeopathic Medical College when he was forty-two years old. He played with Abrams' spondylotherapy and also pushed Fitzgerald's "zone therapy." Then he devel-

oped the fancy-name system that combines a lot of hocus-pocus—it seems one diagnoses disease by a "sympathetic Vagal Reflex." To elicit the said phenomenon, the patient faces east or west and his abdomen is thumped until a dull area is found. Then colored lights are thrown on the abdomen and the thumping is continued. A ruby and blue light with associated dulness means one thing and a green light combination another. That is to say, Dr. White says so; really, it doesn't mean anything. Once Dr. White took a flier in the patent medicine business. The F.S.Sc. (Lond.), with which he is endowed, means "Fellow of the Incorporated Society of Science, Letters, and Arts of London, Ltd." Lots of people who play the same game as White have the same letters. The cost of the elegant diploma is about \$5. Sometimes White also puts after his name D.C., Ph.D., LL.D. No one knows where he got those. The method was given a beautiful send-off in Mr. Macfadden's *Physical Culture* magazine by Dr. Edwin F. Bowers in February 1918. Dr. Bowers is not a doctor of medicine, and the only M.D. he has is the one Macfadden gives him. Strange how the same names recur again and again in these stories of the ghoul-like activities of the harpies who live by exploiting the sick!

In 1925, White produced the last word in this fancy business, the Rithmo-Chrome and Duo-Colors. He has a lot of books to sell and a lot of apparatus. For instance, in his latest announcement, Figure 10 shows a "person sitting on a Filteray Cushion and receiving Filtered Ultrared Rays while doing Rithmo-Chrome breathing and inhaling Oxygen-Vapor or Medicated Vapor and at the time getting therapeutic effect of the magnetic forces of the earth, as he is grounded and facing exactly north and south." If the Duo-Colors are added to this, Dr. White affirms, the patient is certainly getting "Natural Methods Condenset." And if he isn't getting that, what is he getting?

Obviously George Starr White is a quack without any scientific standing, whose opinions on modern medicine are wholly without value.

These effusions against animal experimentation are particularly unfortunate at this time when the nation is seriously concerned with keeping abreast of the rest of the world in problems of national defense. The protection of the sailor in the submarine, of the pilot in the airplane, of the soldier in the chemical warfare service, of hundreds of thousands of men in camps and on ships who are devoting their lives to the defense of the nation depends on the knowledge to be derived from experimentation on animals. The lives of the children of today, who will be the nation's defenders of tomorrow, are saved from the holocausts of infectious disease by the results of experiments on animals. The very lives and health of the vast number of domestic animals used for the industry and the food supply of the nation are protected and saved by the results of experiments on animals. The pets, truly beloved by those who keep them in their homes, are protected by experiments on animals. Yet a few narcissistic, misguided, unthinking seekers for notoriety, most of them women who were once famous in the theater and who perhaps seek to regain the public notoriety and prestige which once were theirs, endeavor to thwart and to inhibit scientific advancement.

Today throughout the United States experimentation on animals is under scientific control. The animals used for such purpose are well fed and are given care superior in many instances to that extended to under-

privileged children in the same communities. Animals which otherwise would have been left to roam the streets to starve and to be found, as they are often found, lying dead from motor vehicle accidents, make their contribution under ideal circumstances to the advancement of the science of care of animals and man. It is inconceivable that any legislature in any state or that the Congress of the United States will permit itself to be cajoled by the personal appearances of these simpering advocates, bewildered by the folly of their ridiculous arguments or misguided by the resurrection, through Mr. Hearst's unthinking paragraphs, of the ancient and maundering lucubrations of the senile Hadwen or the charlatan White.

DOCTORS FOR BRITAIN

Some months have passed since the President of the United States first requested the American Red Cross and a number of medical organizations, including the American Medical Association, to aid the American Red Cross in its effort to comply with the request of the British Red Cross for one thousand physicians to reinforce the British medical services, including the Royal Army Medical Corps and the Emergency Medical Service. In pursuance of this project, extensive announcement was made in the public press. From time to time application blanks have been sent to physicians in the United States who seemed to meet the qualifications. By June 23, 1,343 inquiries had been received; 643 applications had been mailed in response to the inquiries received; 69 physicians who applied had been rated as professionally unqualified; 67 had been pronounced professionally qualified, but of these 2 have withdrawn their applications; 52 applicants are awaiting the decision of the committee, and 33 have been pronounced eligible for a visa. Fifteen applicants are now in process of having physical examinations completed and 17 have been pronounced physically fit. Actually 2 men have been granted United States passports and 15 have reached the stage where they are awaiting passports. The total figure of physicians apparently ready to go or likely to be made available is about 65, with an additional 25 still in process before the committee. This will mean that by the middle of July approximately 90 men will be the response to the request.

Since the announcement was first made there has been some question about the eligibility of married physicians, but a statement has just come from Great Britain authorizing their acceptance. In the Royal Army Medical Corps they will have the same status, salary and allowances as unmarried men except where the total pay for British married officers of the same rank exceeds that for American single men; in such cases the higher rate will then be paid. For the Emer-

gency Medical Service, married men will be accepted on the same terms as single men.

Recent instructions received by the American Red Cross state that native born American citizens who have had their medical training in Great Britain may apply for this service. In each case the qualifications will be passed on by the proper British medical authorities.

The total response to the request from Great Britain is not especially gratifying. In explanation, it may be pointed out that American medical publications and organizations have been repeatedly informed that our own need for physicians is considerable and will be met only with the greatest of difficulty. Already one medical school has announced an increased enrolment of 10 per cent to meet the increased demand for medical men. However, increasing enrolments in medical schools will not make additional physicians available until six years from now. The news from abroad and from Washington seems to indicate constantly the threat of the entrance of our own nation into the war. This also has unquestionably influenced many physicians to hesitate about answering the British appeal.

The opportunity to serve in the far-flung reaches of the British Empire, in China, India, Australia or other British territory is one which is likely to appeal to young medical men without dependents interested in medical experience and adventure. The American Red Cross and the special committee of the Division of Medical Sciences of the National Research Council are continuing their efforts to meet the request for doctors that has come from Great Britain.

TRANSCUTANEAL VIRUS INFECTIONS

Successful inoculation of laboratory animals by the application of a mesodermotropic virus to unabraded skin surfaces has been reported recently by Shaughnessy and Zichis¹ of the Illinois Department of Health.

The skin has been established as an effective barrier against most bacterial infections by earlier experimental pathologists. The possibility that this barrier may be much less effective against ultramicroscopic viruses, however, has been tacitly assumed by many clinicians. It is a common practice, for example, to administer antirabic vaccines to persons whose hands have been licked or otherwise contaminated with the saliva of rabid dogs.

This clinical practice is justified, as was shown about a decade ago by Bauer and Hudson,² who rubbed yellow fever virus on the unabraded skin of rhesus monkeys and were thus able to inoculate these animals with yellow fever. Findlay and Stern³ sub-

1. Shaughnessy, Howard J., and Zichis, Joseph: *J. Exper. Med.* 72: 331 (Oct.) 1940.

2. Bauer, J. H., and Hudson, N. P.: *Am. J. Trop. Med.* 8: 371 (Sept.) 1928.

3. Findlay, G. M., and Stern, R. O.: *J. Path. & Bact.* 43: 327 (Sept.) 1936.

sequently showed that the virus of lymphocytic choriomeningitis is also infectious if similarly applied. Of the 2 rhesus monkeys thus tested by them, 1 developed a typical febrile reaction while the other showed no demonstrable symptoms. Serum from both monkeys, however, contained specific virucidal antibodies when tested on the fifteenth day.

These tests, however, are not acceptable evidence of normal skin permeability, since an attempt was not made to exclude the possibility of the monkeys scratching the virus into the skin or of transferring it to mucous surfaces. Shaughnessy and Zichis therefore repeated skin inoculation tests under meticulously controlled conditions. In their experiments the virus was dropped on the unabraded normal skin surface of an inaccessible region of the body and the area protected against subsequent abrasion by a screw-top screen capsule held in place by means of an adhesive tape girdle. Control animals were similarly inoculated but without the screen protection.

The material used for their transcutaneous tests was a highly virulent strain of lymphocytic choriomeningitis originally isolated by Rivers and Scott.⁴ This strain had been maintained for numerous generations by serial intracerebral passage in guinea pigs. The strain is of high virulence; 0.25 cc. of a 1 per cent suspension of the brain of a guinea pig dying of this infection, if injected intracerebrally into a normal guinea pig, will cause a sharp rise of temperature after an incubation period of from twenty-four to forty-eight hours with collapse, subnormal temperature and death on the sixth to the eighth day. In their percutaneous inoculation tests from 0.5 to 1.2 cc. of a 10 per cent suspension of guinea pig brain soon after necropsy was carefully deposited through the parted hair on the lateral dorso-lumbar region of adult guinea pigs, without the pipet or the syringe touching the skin. The skin was carefully examined with a hand lens both before and after the virus had been deposited and during the subsequent febrile stage. In no guinea pig of their series was any wound, abrasion or macroscopically demonstrable cutaneous irritation noted. The most that was observed was a slightly matted hair, the skin itself being free from visible scaly or dried material.

Of the 57 adult guinea pigs thus tested, 38 (67 per cent) had fever after an incubation period of about five days. All these febrile guinea pigs died with typical virus symptoms between the eighth and twelfth days. In all cases the cause of death was confirmed by intracerebral inoculation of necropsy material into mice, supplemented by specific neutralization tests with virucidal antisera. Although the Chicago experimenters realized that minute cutaneous abrasions, not visible with the hand lens, might have been present on

their animals, they felt justified in concluding from their evidence that a highly virulent strain of lymphocytic choriomeningitis virus is capable of penetrating the presumably intact normal skin of adult guinea pigs at a sufficient rate and in sufficient quantities to cause a lethal virus infection.

Whether or not transcutaneous infection would tend to explain the puzzling epidemiology of lymphocytic choriomeningitis was not discussed, nor was normal skin permeability to a low virulent or avirulent strain of the same virus tested by the Chicago investigators.

MEDICAL AID FOR BRITAIN

The British Ministry of Health some months ago sent to the American Red Cross and released for general circulation a statement regarding the shipment of medical supplies and personnel to Great Britain. This statement from the British Minister of Health follows:

We fully recognize that the American Red Cross holds a predominant position in all matters affecting doctors, nurses, hospitals and medical supplies, both because of the conventions under which it was established, and because of its very widespread organization. For these reasons the Ministry proposes, in the future, to send all requests for medical and nursing personnel, hospitals and hospital equipment and medical and surgical equipment and supplies through the British Red Cross to the American Red Cross. Consequently, from this date, no requests for these kinds of aid shall be forwarded to any other American organization. Furthermore, offers of American aid which fall within the above defined limits will be referred by the Ministry through the British Red Cross to the American Red Cross for consideration and approval.

You will, of course, appreciate that there exist current and previously accepted commitments between the Ministry and other American organizations which cannot be withdrawn. It is our intention to complete our existing commitments with these organizations insofar as they do not conflict with the above stated position.

I am anxious further to emphasize that no request will be put forward by the Ministry that is not a request to meet a real need and to make up deficiencies whether of personnel or material which either cannot be met at all or where, as is the case of surgical instruments, production is extremely slow.

I trust the procedure I have outlined is one that will meet with the concurrence of the American Red Cross, but I am anxious to say that, important as it is that a clear and simple procedure should be adopted, it would not be right that I should close this letter without expressing our most sincere, and warm appreciation to the American Red Cross for the generous assistance it has afforded us in the past and for its equally generous offer to continue to help.

The statement is again published at this time because of the numerous letters that are received in the headquarters of the American Medical Association regarding solicitation from various organizations which are endeavoring to collect surgical instruments, medical supplies, drugs and funds as an aid to Great Britain.

The information available indicates that at this time the general solicitation and shipment of medical, surgical and hospital supplies and equipment, unless in response to specific requests to the American Red Cross,

4. Rivers, T. M., and Scott, T. F. M.: *Science* 81: 439 (May 3) 1935.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

EXAMINATIONS FOR TUBERCULOSIS

ROENTGENOGRAPHIC FINDINGS OF 41,809 INDUCTEES
AND 9,541 NATIONAL GUARDSMEN IN
NEW YORK CITY

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The problem of tuberculosis in the armed forces has long been known but it has been especially emphasized since our experience in the first World War. Chest physicians and health and welfare organizations interested in tuberculosis control have consistently advocated a routine chest roentgenogram of all men entering the armed services. This interest has crystallized itself into definite proposals to the Army and Navy within the past year or so, when it became obvious that this country was planning to launch a preparedness program and to adopt a selective service and training act.

In an address before the American College of Physicians delivered April 1, 1940 Col. C. C. Hillman¹ said in part: "Since it is important for the individual as well as for his associates and for the pension rolls to exclude cases of pulmonary tuberculosis from military service, routine chest roentgenograms, or routine skin tests with roentgen ray examination of positive reactors, will *probably* (italics ours) be employed to eliminate cases of tuberculosis that have not been detected by physical examination." It will be noted that the acceptance of a routine roentgenogram of the chest was not definite at that time.

In the early part of 1940 the National Research Council² set up its committee on the various medical sciences to correlate the best thought of leaders throughout the country for the benefit of the federal services. A subcommittee on tuberculosis of the General Committee on Medicine was organized. This committee began its deliberation during the summer of 1940 and offered suggestions and recommendations to the Army and Navy concerning diagnostic methods and procedures for the control of the disease in the military services.

From the outset the importance of a routine chest roentgenogram was emphasized and accepted in principle by the medical personnel of both services. The Army was requiring a chest roentgenogram in the examination of commissioned personnel, and the Navy was requiring the same for enlisted as well as commissioned men. It would have been almost impossible for the Army to acquire and set up facilities for the

routine roentgenographing of all men inducted through the Selective Service Act immediately after the act went into effect.

One of the first problems considered by the subcommittee on tuberculosis of the National Research Council was the terminology of the Army Manual as it related to tuberculosis and chest diseases. Certain revisions were recommended and accepted and are now incorporated in Mobilization Regulations No. 1-9 as of Aug. 31, 1940. While these regulations did not require a chest roentgenogram as a routine part of the examination of the inductee, they did define in detail the general character of minimal or arrested lesions by roentgenogram that would be permissible under Class 1-a.

As a result of increased urging by official and voluntary health agencies that were willing to set up facilities locally to provide such service, a directive from the Adjutant General's Office of the U. S. Army under date of Oct. 28, 1940 stated in part:

3. At induction places other than at Army stations, arrangements with state or civilian roentgenological laboratories will be made at the earliest practicable date. When it is feasible to supply these laboratories with government films, timely requisitions will be made to the Surgeon General by corps area and department surgeons. . . . Payment for these films and for the services of civilian roentgenologists may be made, however, by corps area surgeons from procurement authority.

4. Should belated reports reveal the presence of defects disqualifying under the provisions of Mobilization Regulations 1-9 in individuals who have been inducted and forwarded to reception centers or training stations, such reports will be transmitted to these respective stations and action taken to effect the prompt discharge of such individuals on certificates of disability.

Thus this order provided an opportunity for local agencies to set up and operate a roentgenographic service for men inducted and to be compensated by the government until such time as the Army could assemble its equipment and assume full responsibility. Unfortunately, only a few local agencies in the country were aware of this opportunity or were sufficiently interested or equipped to conduct routine roentgen examinations for the corps area commanders.

Further emphasis on this problem is to be found in an article by Ramsey Spillman³ on the value of radiography in detecting tuberculosis in recruits. His analysis of statistical data from the U. S. Veterans' Administration indicated that the cost to the government of a case of tuberculosis in a veteran of the World War was about \$10,000 per man to date. Also that within the next five years the total cost of service connected disability payments would reach the staggering total of approximately one billion dollars. Major A. A. deLorimer, addressing the 1940 annual meeting of the Radiological Society of North America, quoting Spillman's article, stated in part that the Army was

1. Hillman, Charles C.: Medical Problems Encountered in Military Service, *Ann. Int. Med.* 13:2205 (June) 1940.

2. Cushing, E. H.: The Health and Medical Committee, *War Med.* 1:66 (Jan.) 1941.

3. Spillman, Ramsey: The Value of Radiography in Detecting Tuberculosis in Recruits, *J. A. M. A.* 115:1371 (Oct. 19) 1940.

arranging to use the roentgen ray extensively to minimize and prevent a repetition of such a situation.

Councell,⁴ in a recent report on war and infectious disease, stated that between April 1, 1917 and Dec. 31, 1919 there were 27,274 primary admissions of tuberculosis to the U. S. Army, an annual rate of 12.2 per thousand. She pointed out that there were lost 2,636,722 days from active duty, a noneffective rate of 3.7 per thousand. She also stated that: "Up to March 1918 a total of 1,500,990 men had been reexamined and 9,648 recommended for discharge for pulmonary tuberculosis, a total of 8 per 1,000. In the period of demobilization, from November 1918 up to June 30, 1919, there were 2,500,662 men examined, of whom only 1,356, or 0.54 per 1,000, were found to be tuberculous."

As a roentgenogram of the chest was not routine in these examinations, it is likely that a large proportion of the 9,648 men recommended for discharge on reexamination and the 1,356 so diagnosed during demobilization could have been eliminated before induction if each man had had a roentgenogram of his chest.

Recent reports from the Surgeon General's Office indicate that the Army is now committed to a routine roentgen examination of all recruits at the induction centers. The latest advice indicates that each station will be provided with standard roentgen ray units capable of using 14 by 17 celluloid or paper film in the conventional manner and some will be equipped in addition with the 4 by 5 inch fluorograph. The purchase and installation of this equipment will probably not be available throughout the nation before the fall of 1941. In addition to the routine roentgenogram on admission, roentgenograms will also be taken at the time of discharge. The next logical step will be periodic roentgen examinations of men in the service and will represent both an ideal and a very practical plan of procedure.

NEW YORK CITY'S CONTRIBUTION

The Bureau of Tuberculosis of the New York City Department of Health has been engaged in the mass roentgen ray survey of the apparently healthy population as a method of case finding since 1933. As of Dec. 31, 1940 a total of 330,923 individuals have been examined. An extensive report of some of these findings was published as a supplement to the *American Review of Tuberculosis*.⁵ These surveys have been accepted as a basic part of the tuberculosis control program in New York City. Thus, our interest in providing a similar service for inductees and members of the state National Guard was based on well founded experience. Accordingly, our mass roentgen ray services, which were made possible through a project with the Works Progress Administration, were offered to the surgeon of the Second Corps Area prior to the directive that was issued by the Adjutant General's Office on Oct. 28, 1940.

The Department of Health received assistance in this work from the Queens Tuberculosis and Health Association in the form of payment for roentgenograms taken of inductees included in the first two calls and clearing through the Queens Induction Station.

The major part of this report will deal with the men inducted into the Army through induction stations of New York City from Nov. 25, 1940 to Jan. 15, 1941

and for National Guardsmen who were inducted into the federal service between Jan. 27 and March 10, 1941.

The department of health provided all materials and personnel for the Army Induction X-Ray Service from Nov. 25, 1940 until Jan. 1, 1941 excepting the cost of films, as mentioned. In addition, in Queens and the Bronx the two tuberculosis associations of the two boroughs assisted in payment of part of certain physicians' sessions.

After Jan. 1, 1941 the Army assumed full financial responsibility for the roentgen ray service in induction centers, the department providing personnel for the interpretation of films. Since January 15 this service has also been taken over by the Army, which has assigned medical reserve officers qualified in this special field. The roentgenographing of national guardsmen has been entirely at the expense of the department of health. Under existing regulations the Army could not pay for this service until after induction, and it was important that rejections be made before that date.

The Second Corps Area included the states of New York, New Jersey and Delaware. This report is concerned with that part of the entire area known as the Southern New York District, comprising New York City, Long Island and the five counties of Westchester, Orange, Rockland, Dutchess and Putnam. This area represents approximately 52 per cent of the population of the entire Second Corps Area, yet the number of men inducted in this district is reported to be about 60 per cent of the entire corps area.

At the outset there were four induction stations. Since January 1941 all work has been done in two stations, one in Manhattan and one in Queens.

PLAN OF OPERATION

Equipment, to be described later, was set up in each station. The inductees were usually roentgenographed on arrival at the station to allow as much time for processing of films and reading as possible. As the recruit was supposed to be cleared through all examinations and made ready for induction and transfer to a reception center (Fort Dix or Camp Upton) by 1 p. m. or not later than 2:30 of the same day it was necessary to have a report on the roentgenogram within an hour or less.

The responsibility for rejection on the basis of the roentgenogram was assigned to the clinician reading films and in conformance with Mobilization Regulations 1-9.

At the time of rejection all men residents of New York City were given an appointment within the next two or three days to appear at the Health Department's Central Chest Clinic for further study. At that time a complete study was made of the case, including history, physical examination, sputum, fluoroscope, roentgenograms in one or more positions, iodized oil or whatever other examinations were deemed essential to arrive at a final diagnosis. If the findings warranted rejection under Mobilization Regulations 1-9, a report was sent to the chairman of the local draft board indicating that the inductee was permanently rejected. If, on the other hand, the subsequent examination proved the original findings to be of no significance, a letter to the chairman of the local draft board indicated that, unless there were other rejections against the applicant, he could be referred back to the induction center as satisfactory. This happened in several instances. This same cooperative procedure between the department of health and the Army in clearing cases rejected at the induction center has continued even though the Army

4. Councell, Clara E.: War and Infectious Disease, Pub. Health Rep. 36: 547 (March 21) 1941.

5. Edwards, Herbert R.: Tuberculosis Case Finding Studies in Mass Surveys, Am. Rev. Tuberc. (supp.) 41, June 1940.

has been responsible for all work at the induction station.

In the case of rejected men outside New York City, a report of the original roentgen ray findings with recommendations for further study similar to the service provided for residents of New York City was sent to the chairman of the local draft board in the county of his residence.

METHOD OF ROENTGEN RAY EXAMINATION

The necessity for rapid service has already been indicated. When plans had to be made to handle from sixty to three hundred or more men per unit daily it was impossible to use the rapid roll method that has been so effective in our routine survey program. The men reported at the center at 8 a. m. and after preliminary registration were referred to the roentgen ray unit, where a staff of WPA clerks completed survey cards with the essential facts for final analysis of the data. A lead identifying marker was cut showing name, roentgen ray number and other identification data. The man was then roentgenographed and promptly referred

culosis were rejected, based on the possibility of lesions of this type seen in our studies becoming aggravated under conditions of military service. Primary lesions considered as active or extensive calcification were likewise rejected. Other forms of significant pulmonary disease, such as bronchiectasis, pneumonitis, atelectasis or extensive pleural changes, were cause for rejection until further study could determine their importance. Men with obviously abnormal cardiac silhouettes were reported to the medical examiners for such further study as might be indicated. Men with nothing more than apical caps, and those with small well healed primary lesions were not rejected.

ANALYSIS OF FINDINGS

The findings presented herewith are made up of (1) those obtained up to January 15, that is, during the period when the department of health was actively engaged in the program, and (2) those secured since January 15, when the Army assumed full responsibility.

1. The first group consists of the analysis of the roentgenograms of 16,150 individuals; 6,609 inductees

TABLE 1.—*Inductees and National Guardsmen, Southern New York District, 1940-1941*

Unit	Number Roentgen- ographed	Mean Age	Rejected Under M. R. 1-9							
			Total Rejected		Pulmonary Tuberculosis				Number Other Pulmonary	
					Active		Arrested			
			No.	%	No.	%	No.	%	No.	%
71st Field Artillery Hdq. and Hdq. Battalion....	80	24.9	2	2.50	1	1.25	..	....	1	1.25
101st Military Police.....	449	21.3	7	1.56	3	0.67	4	0.89	..	....
101st Signal Battalion.....	270	22.8	6	2.15	1	0.36	1	0.36	4	1.43
101st Cavalry.....	981	24.9	11	1.12	5	0.51	4	0.41	2	0.20
102d Coast Artillery.....	74	24.2	1	1.35	..	....	..	....	1	1.35
102d Co. C Anti-Tank.....	105	22.0	..	....	..	....	..	....	..	....
180th Field Artillery.....	937	23.3	7	0.75	1	0.11	5	0.53	1	0.11
187th Field Artillery.....	012	23.4	12	1.32	5	0.55	4	0.44	3	0.33
191st Co. A Tank Battalion.....	114	23.9	2	1.75	..	....	1	0.89	1	0.89
207th Coast Artillery Anti-Aircraft.....	1,580	25.0	13	0.83	4	0.25	8	0.51	1	0.06
212th Coast Artillery.....	1,243	23.9	12	0.97	2	0.16	8	0.64	2	0.16
253th Field Artillery.....	1,432	23.4	15	1.05	5	0.35	0	0.00	1	0.07
369th Coast Artillery.....	1,355	25.1	27	1.99	14	1.03	12	0.89	1	0.07
Total National Guard.....	9,541	24.2	115	1.21	41	0.43	56	0.59	18	0.19
Total inductees first two draft calls.....	6,609	25.7	90	1.36	20	0.44	46	0.70	15	0.23
Grand total	16,150	24.8	205	1.27	70	0.43	102	0.63	33	0.20

to another location to start his complete physical examination.

The x-ray apparatus consisted of a 150 milliampere, 90 kilovolt four valve tube machine constructed so as to be easily transportable. A modification of the roll paper camera was used in connection with a specially constructed portable dark room measuring 8 by 8 feet with the back of the camera integrated into one side of the dark room.

A signal device was installed between the roentgen ray technician and the dark room. As soon as a film was exposed, the signal was flashed and the dark room crew cut off the film and placed it in the developing bath. The signal was then reversed indicating that another film was ready to be exposed. A team of three, consisting of a technician and two dark room assistants, were able to operate faster than one exposure a minute. The films were processed in large trays and from the fixing bath were passed out to the physician through a light-proof pass. After being read, the films were washed in a portable tank and dried in a special device designed for the purpose.

CLASSIFICATION OF LESIONS

As previously indicated, acceptance or rejection was based on army regulations M. R. 1-9. Section XIII. Men showing any form of reinfection types of tuber-

(100 per cent) and 9,541 Guardsmen (all members of thirteen units of the state National Guard). A general summary of the principal observations in these two groups will be found in table 1.

From table 1 it will be noted that the mean age for the two groups appears to be about the same. However, the actual distribution by age is somewhat different, as indicated in tables 2 and 3. Approximately 34 per cent of the Guardsmen were below the age of 21. On the other hand, only about 0.5 per cent of the inductees were below that age. Among the National Guardsmen approximately 3 per cent were above 36; the Negroes supplied twice as many men above this age group.

The 369th Coast Artillery, an all Negro regiment, had the highest mean age in all groups. It also had the widest scatter around that age and relatively more concentration in the upper age groups. This regiment had the highest rate of rejection of all groups, which was almost entirely on the basis of tuberculous pulmonary disease. It also had the highest percentage of men with primary infections. If the findings in this unit are subtracted from the totals of all Guard units a greater difference will be found between Guardsmen and inductees.

The differences noted between the individual units of the National Guard appear on further statistical

analysis to be of little importance in consideration of the numbers involved at specific age periods.

The material was studied by age groupings with the latest available census estimates of the population. It appears that there is a departure from the population curve particularly in the upper age range. It is not known how much of this is due to elimination by the local draft board on economic grounds or for pathologic conditions.

A classification by stages of disease of the 70 men considered clinically significant shows that 46, or 65.7 per cent, were minimal, 23, or 32.9 per cent, moderately advanced and 1, or 1.4 per cent, far advanced. Of these totals the 29 inductees contributed 22 minimal

the outset. During the latter period 35,210 men were roentgenographed. Thus, with the 6,609 inductees reported previously the total to March 31 has been 41,819.

Since the assumption of full responsibility by the Army on January 15 we have not attempted to collect data similar to the material previously presented. The following comments, therefore, can deal only in gross numbers.

Of the 35,210 individuals, a total of 491, or 1.4 per cent, were rejected at the induction centers. Of this number 458 were residents of New York City and would therefore be referred to our clinic for final classification. The remaining 33 from outside the city would

TABLE 2.—Results of Roentgen Ray Examinations of 9,541 National Guardsmen, Southern New York District, 1940-1941

Age Group	Number Roentgenographed	Race		Total Rejections Under M. R. 1-9		Reasons for Rejection									
						Chronic Pulmonary Tuberculosis									
		White	Negro	No.	%	Active		Per Cent		Arrested		Per Cent		Number Other Pulmonary	
						White	Negro	White	Negro	White	Negro	White	Negro	White	Negro
17-19.9	1,823	1,072	251	8	0.61	3	1	0.28	0.40	1	..	0.09	...	3	..
20-22.9	3,885	2,929	456	35	1.08	9	5	0.31	1.10	10	4	0.34	0.88	7	..
23-25.9	2,438	2,232	206	17	0.70	6	1	0.27	0.49	6	2	0.03	0.97	2	..
26-28.9	1,168	1,009	159	18	1.54	7	1	0.69	0.63	8	1	0.79	0.83	1	..
29-31.9	517	452	65	17	3.11	1	4	0.22	4.21	8	..	1.77	...	4	..
32-34.9	317	244	73	5	1.58	..	..	...	...	3	2	1.23	2.74	..	..
35-37.9	160	113	47	8	0.50	1	..	0.88	...	5	2	3.54	4.32	..	..
38-40.9	72	41	31	4	5.56	..	2	...	6.45	1	1	2.44	3.23	..	..
41-43.9	46	31	15	2	4.35	..	..	...	...	1	..	3.23	...	..	1
44-46.9	33	23	10	1	3.03	..	..	...	...	1	..	4.35	...	..	..
47-49.9	28	17	11	..	...	..	..	...	...	..	..	...	...	..	..
50 and over	24	10	4	..	...	..	..	...	...	..	..	...	...	..	..
Total	9,541	8,183	1,358	115	1.21	27	14	0.33	1.03	44	12	0.54	0.88	17	1

TABLE 3.—Results of Roentgen Ray Examinations of 6,609 Army Registrants, Southern New York District, 1940-1941

Age Group	Number Roentgenographed	Race		Total Rejections Under M. R. 1-9		Reasons for Rejection									
						Chronic Pulmonary Tuberculosis									
		White	Negro	No.	%	No. Active		Per Cent		No. Arrested		Per Cent		Number Other Pulmonary	
						White	Negro	White	Negro	White	Negro	White	Negro	White	Negro
17-19.9	20	20	..	..	...	..	..	...	...	..	..	...	...	..	..
20-22.9	1,967	1,917	34	15	0.96	7	..	0.37	...	6	..	0.31	...	2	..
23-25.9	2,107	2,047	39	19	0.90	7	..	0.34	...	9	..	0.44	...	2	..
26-28.9	1,200	1,154	31	18	1.50	5	..	0.43	...	9	..	0.76	...	3	1
29-31.9	678	648	20	17	2.51	3	..	0.46	...	10	..	1.54	...	4	..
32-34.9	479	456	19	15	3.13	4	1	0.88	5.26	7	..	1.54	...	2	..
35-	145	138	4	6	4.14	1	..	0.72	...	3	1	2.17	25.0	1	..
Total	6,609	6,393	146	90	1.36	28	1	0.44	0.68	45	1	0.70	0.44	14	1

and 7 moderately advanced, giving them proportions of 75.9 and 24.1 per cent respectively.

Considering the total number roentgenographed, primary lesions indicated by calcific deposits were found in 6 per cent of the white men, 8.7 per cent of the Negroes and 7.1 per cent of the Puerto Ricans.

Other classifications by color are of interest. Abnormal cardiac shadows were found in 0.43 per cent of the white men and in 0.46 per cent of the Negroes. Pleural abnormalities not rejectable were present in 3.38 per cent of the white men and 4.2 per cent of the Negroes. Bone abnormalities not rejectable were seen in 5.1 per cent of the white men and 3.9 per cent of the Negroes.

2. The second part of the analysis deals with the men roentgenographed at induction centers since Jan. 16 and through March 31, 1941. The department of health's part during that period has been to reexamine and classify New York City men rejected at the induction center. This is a continuation of our policy from

be referred to their local draft board for such examination.

Up to the time that this report was written, 379 of the 458 men have been examined and cleared at our clinic. The 79 will undoubtedly be cleared in due course. The relationships between the draft boards and the health department have been cordial, and when the rejected man fails to report at the clinic the fact is reported to the chairman of his local board.

The further study of the 379 at our clinic has confirmed the cause of rejection in 330. Of these, 301 were rejected on the basis of chronic pulmonary tuberculosis and 29 for nontuberculous pulmonary disease. Thus, it will be noted that in 49, or 12.9 per cent, the cause for rejection at the induction station was not confirmed and the man was considered suitable to be accepted in the Army from the standpoint of his roentgenogram. The percentage of diagnosis not confirmed in this series was lower than a similar group examined prior to January 15. That figure was 31.3 per cent.

With experience we are undoubtedly improving our technic and ability to evaluate the case properly. This experience also indicates the difficulties involved in this work when it is established on a nationwide basis.

A classification of lesions in the 301 rejected men showed 108 as significant and 193 as apparently arrested lesions not safe risks for military training.

As the same physicians at the induction centers interpreted all films, it is reasonable to assume that the follow-up examination of the entire 491 rejected men would be the same as the results obtained in the 379. On this basis then there would be 389, or 1.10 per cent, finally rejected on the basis of chronic pulmonary tuberculosis. Those classified as clinically significant would be 139, or 0.4 per cent; and 250, or 0.71 per cent, would be apparently arrested lesions. These figures are quite comparable with similar rates for inductees in table 1.

The distribution by stage of disease on the foregoing assumptions would be minimal 50 per cent, moderately advanced 42.6 per cent, and far advanced 7.4 per cent.

REJECTIONS FOR CONDITIONS OTHER THAN TUBERCULOSIS

It will be noted in table 1 that 33 were rejected for "other pulmonary conditions" within the definition of M. R. 1-9. To these may be added 29 found in the

TABLE 4.—Conditions for Which Rejections Have Been Made Since January 16

Bronchiectasis.....	23
.....	8
.....	6
.....	5
Neoplastic disease.....	5
Pulmonary cyst.....	2
Atelectasis.....	2
Effusion.....	2
Pulmonary abscess.....	1
Bullous emphysema.....	1
Pneumoconiosis.....	1
Rheumatic heart.....	1
Pott's disease.....	1
Undetermined lesions.....	4

examination since January 16. For convenience the 62 cases may be summarized as in table 4.

COST ANALYSIS

It is important to consider the cost of this added procedure in the clearing of recruits for military service. The total cost of services rendered by the department of health, including the cost of films from Jan. 1 to Jan. 15, 1941 paid by the Army was \$23,614.20. If Spillman's estimate of \$10,000 as the cost to the government of a man with tuberculosis admitted into military service is correct, this study represents a saving to the federal authorities of about \$1,720,000.

In table 5 is presented an itemized statement of the cost of materials and personnel utilized in the completion of examinations in the two groups. The first stage of operation, "service at examination center," is that part of the routine services that would doubtless be of the greatest interest to the Army, as it represents the cost of roentgenographing and rejecting a man without the necessary follow-up. As presented in this statement the item of \$3,163 for clerical service might be omitted by the Army, as it represented the cost of clerks to prepare survey information for future analysis. Also we used approximately a third more clerical personnel than was necessary for the actual work done, because at the outset the necessary number of persons was not known and every effort was made to obviate a slowing

up of the flow of men through the roentgen ray phase of examination. On the other hand, if the Army should attempt to make a detailed analysis of this work, clerical assistance would be required.

TABLE 5.—Cost of Roentgen Ray Examination for 6,609 Selective Service Inductees and 9,541 National Guardsmen

Type of Service	Inductees	Guardsmen	Total
Service at examination center			
Paper roentgenograms.....	\$5,304.00	\$7,657.20	\$12,961.20
Clinician to interpret.....	450.00	.....	450.00
Clerical assistance.....	1,163.00	2,000.00	3,163.00
Follow-up examination at central chest clinic			
Personnel:			
Clinicians.....	120.00	750.00	\$870.00
Nurses.....	130.00	210.00	340.00
Roentgen ray technician.....	40.00	60.00	100.00
Clerical, stenographic, statistician....	1,800.00	2,500.00	4,300.00
Supplies:			
Films and chemicals.....	70.00	100.00	170.00
Miscellaneous.....	30.00	40.00	70.00
Sputum examination @ 35 cents.....	45.00	75.00	120.00
Overhead (rent, heat, telephone).....	120.00	225.00	345.00
Depreciation in equipment.....	20.00	30.00	50.00
Supervision:			
Bureau staff.....	200.00	350.00	550.00
WPA.....	50.00	75.00	125.00
Grand total.....	\$9,542.00	\$14,072.20	\$23,614.20

A reasonable estimate of cost for the roentgenogram and the clinician's time for interpretation at the induction center would be \$5,574. In the case of Guardsmen the cost of interpreting the paper roentgenograms is estimated at \$500, which is included in the item "clinician" in the follow-up examination, because their films were read at the central chest clinic. Thus the cost of the roentgenograms and the clinician's services for the latter group would be \$8,157.20; for both groups a total of \$13,911.20, or 58.8 per cent of the total cost for the complete service.

A comparison of unit costs for rejecting a man on the basis of the original roentgenogram and the interpretation and the complete follow-up is shown in table 6.

The items included in the cost analysis may be briefly analyzed as follows: Paper roentgenograms represent a service by the vendors. They provided the equipment, technicians, film and the processing of the latter to the point of delivery to the department of health. The cost was scaled on the basis of the number of men roentgenographed in a given day. For 500 or more the unit cost was \$0.75 and for 200 or less \$1 per person. The numbers examined daily during these studies varied; thus the average cost per roentgenogram was 80 cents.

TABLE 6.—Comparison of Cost to Reject Inductees and Guardsmen on Basis of Roentgen Ray Examinations for Chronic Pulmonary Tuberculosis and Other Causes

Cause of Rejection	No.	Inductees		Guardsmen		
		Unit Cost *		Unit Cost *		
		1	2	1	2	
Chronic pulmonary (arrested and significant)...	75	\$76.72	\$127.23	97	\$84.09	\$145.07
Significant pulmonary tuberculosis.....	29	198.41	329.03	41	108.96	343.22
Other causes.....	15	383.69	636.13	18	453.18	781.79
Rejection for all causes...	90	63.93	106.02	115	70.93	122.37

* 1, original roentgen ray and interpretation; 2, original and follow-up examination.

The clerical personnel was almost entirely from the WPA. Clinicians, nurses, roentgen ray technicians and supplies were provided by the department of health. The cost of a sputum examination at 35 cents represents overhead, personnel and materials; under "overhead" a charge was made for the use of space and

service based on cost analyses used in our work. Depreciation represents a reasonable charge against the department's roentgen ray equipment. The item of supervision represents a pro rata charge against the administrative staff of the department of health and the WPA. While these various items are more inclusive than those generally quoted for cost studies of this character, they are nevertheless considered to represent the actual cost of such a program.

SUMMARY

The Department of Health of New York City with the cooperation of the surgeon of the Second Corps Area set up and organized a chest roentgenographic service at the induction centers in the Southern New York District for all inductees of the Selective Service from the first call, Nov. 25, 1940. The complete service was taken over by the Army as of Jan. 15, 1941.

The department of health also provided a routine chest roentgenogram for all members of thirteen National Guard units inducted into the federal service between Jan. 27 and March 10, 1941.

A total of 6,609 selective service inductees were roentgenographed and 90, or 1.36 per cent, were rejected on the basis of chest roentgenographic findings, 29, or 0.44 per cent, on the basis of lesions typical of significant pulmonary tuberculosis, 46, or 0.70 per cent, with lesions typical of arrested pulmonary tuberculosis, and 15, or 0.23 per cent, on the basis of primary lesions other than tuberculosis.

A total of 9,541 National Guardsmen were roentgenographed, and 115, or 1.21 per cent, rejected for all causes. Forty-one, or 0.43 per cent, for significant tuberculosis, 56, or 0.59 per cent, for arrested pul-

monary tuberculosis and 18, or 0.19 per cent, for other than tuberculous lesions.

As a group the selective service inductees gave a higher percentage of rejections in each category than did the Guardsmen. If the 369th Coast Artillery (Negro) unit is excluded from the Guardsmen's total, this difference becomes greater.

A detailed cost analysis of personnel, equipment and materials necessary to complete this study indicated a total of \$23,614.20. Using this as a basis for computation, the unit cost to examine each individual by roentgenogram was \$1.47. The cost of taking a roentgenogram and its interpretation without any further follow-up was \$13,911.20, or 58.8 per cent of the total. On this basis the unit cost to examine each individual was 0.867 cent.

The unit cost to reject a man for military service on the basis of the total cost was \$106.02 for inductees and \$122.37 for Guardsmen, on the basis of a single roentgenogram and its interpretation \$63.93 for inductees and \$70.93 for Guardsmen.

In addition to the studies participated in directly by the department of health up until January 15, there have been 35,210 men cleared in the induction stations up to March 31, 1941. Of this total it is estimated that 389, or 1.1 per cent, are rejectable on the basis of chronic pulmonary tuberculosis.

Spillman has reported that the cost to the federal government of accepting a person with tuberculosis into the armed services is \$10,000. Thus, in these studies involving 41,819 inductees and 9,541 Guardsmen, or a total of 51,360 men, 561 persons with chronic pulmonary tuberculosis were rejected, representing an estimated saving to the government of \$5,610,000.

NEW MOBILE ROENTGEN RAY UNIT FOR ARMY HOSPITALS

A new mobile roentgen ray unit that can be packed or unpacked in fifteen minutes and produce roentgenograms for study in about a half an hour is being delivered to army hospitals, the War Department has announced.

Developed at the Army Medical Center, Washington, D. C., the unit is designed to provide field doctors with complete fluoroscopic and roentgen ray facilities. It is so compact and detachable that it permits hasty removal in time of danger.

Major Alfred A. de Lorimier, director of the department of roentgenology at the Army Medical School, who supervised the development of the unit, said that each component of the nine part unit weighs less than 200 pounds.

Far less cumbersome and much safer to handle than the equipment used in field stations during the World War, the new unit is the first to be designed especially for army use since 1918.

Because it is adaptable for use in permanent hospitals as well as in temporary field tents, the unit has been authorized for every type of army medical station. Quantity delivery of some of the most recently designed parts has just been started.

The various sections of the unit come packed in special trunks, each of which can be carried by two men. Among the equipment is a black tent, as easy to set up within a room as in a field, serving either as a fluoroscope compartment or as a dark room for processing film.

Other items are a gasoline-operated generator and a refrigerator-heater combination that keeps the water in the developing tank at a constant temperature between 60 and 70 F.

One feature is an air-cooled fluoroscopic tube that permits its constant use twenty-four hours a day. The old type tube could be used only for ten minute periods and then had to be turned off for cooling.

The equipment is shock proof, and its fluoroscopic screen can be adjusted handily to examine patients in horizontal and standing positions as well as sitting.

ADDITIONAL HOSPITAL FACILITIES AT AIR CORPS STATION

Construction of additional hospitalization facilities at fifteen Air Corps stations in all parts of the country at an estimated cost of \$1,209,129, made necessary by increases in strength under the thirty thousand pilot training program, has been authorized by the War Department.

Stations Under Construction

Station	Construction	Amount
Albany, Ga.	Expansion of hospital to 151 beds.....	\$ 74,800
Barksdale Field, La.	Addition to one ward.....	16,760
Elgin Field, Fla.	Expansion of hospital to 144 beds....	188,260
Ellington Field, Texas	Addition to two wards.....	34,800
Macon, Ga.	Expansion of hospital to 118 beds.....	36,480
Mather Field, Calif.	Addition to one ward.....	17,400
Maxwell Field, Ala.	One officers' quarters, 1 mess, 2 barracks, 5 wards, 1 infirmary, utilities and engineering	160,579
San Angelo, Texas	Addition to one ward.....	17,870
Gunter Field, Ala.	Construction new 118 bed cantonment type hospital	236,140
Panama City, Fla.	Expansion of hospital to 170 beds.....	129,560
Phoenix, Ariz.	Expansion of hospital to 144 beds.....	91,900
Randolph Field, Texas	Addition to three wards.....	54,270
Selma, Ala.	Addition to one ward.....	17,870
Stockton, Calif.	Addition to one ward.....	15,810
Victoria, Texas.	Expansion of hospital to 144 beds.....	116,630
Total		\$1,209,129

The stations, the construction, and the amount of the project at each station are given in the accompanying table.

SURGEONS OF THE FOUR ARMIES

The medical officers who will serve as surgeons of the four armies have been selected and are as follows:

GIBSON, Paul W., Colonel, 2d Army, Memphis, Tenn.
McCORNACK, Condon C., Colonel, 4th Army, Presidio of San Francisco.
McDONALD, Robert C., Colonel, 3d Army, San Antonio, Texas.
WEED, Frank W., Colonel, 1st Army, Governors Island, N. Y.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY WAR DEPARTMENT

The following additional medical reserve corps officers have been ordered to extended active duty by the War Department, Washington, D. C.:

BANNERMAN, Moss Morton, 1st Lieut., New Orleans.
BARRETT, Maurice E., 1st Lieut., Fort Stockton, Texas.
BLAIR, John Dennis, Captain, Iowa City.
BROWN, Wilson Gordon, 1st Lieut., St. Louis.
CONLEY, John Joseph, 1st Lieut., Carnegie, Pa.
EICHHORN, John P., 1st Lieut., Cleveland.
ELTON, Norman William, Major, Buffalo.
FREEMAN, Robert Gowans, 1st Lieut., San Marino, Calif.
GORLIN, David Oscar, Captain, South Ozone Park, N. Y.
GRUNNAGLE, Jerome Francis, 1st Lieut., Pittsburgh.
HANLON, Thomas Joseph, Jr., 1st Lieut., Clayton, Mo.
HAYNES, Leigh Kendel, 1st Lieut., Brooklyn.
HUGHES, Harold Franklin, 1st Lieut., Philadelphia.
KIMBROUGH, Robert Cooke, Jr., 1st Lieut., Madisonville, Tenn.
KITCHIN, William Walton, 1st Lieut., Philadelphia.
McCULLOUGH, Robert William, 1st Lieut., Charlottesville, Va.
McKEE, Thomas Lapsley, Captain, Keokuk, Iowa.
MARTIN, Stevens John, 1st Lieut., Madison, Wis.
METZGAR, Thomas L., Captain, Stroudsburg, Pa.
MIKULENCAK, Benjamin August, 1st Lieut., Dallas, Texas.
MOORE, Donald Edmund, 1st Lieut., Medford, Ore.
MULE, Joseph Salvatore, 1st Lieut., Jamaica Estates, N. Y.

PADDEN, Edmund Henry, Major, Oakland, Calif.
PRESCOTT, Manfred Ullman, Major, San Francisco.
REID, Frederick Kessinger, 1st Lieut., Rome, N. Y.
RINGNESS, Henry Raymond, 1st Lieut., Washington, D. C.
RYAN, Andrew Morris, 1st Lieut., San Francisco.
SASKO, Vladimir Molnar, 1st Lieut., Chicago.
SCHAECLA, Woodrow Warner, 1st Lieut., Santa Barbara, Calif.
SCHNEELY, John Thomas, 1st Lieut., Silver Springs, Md.
SCHWARTZ, Walter William, 1st Lieut., Iowa City.
WANGEMAN, Clayton Prater, Captain, Madison, Wis.
WAY, Roger Atkinson, 1st Lieut., Spartanburg, S. C.
WILLIS, John Mitchell, Jr., 1st Lieut., Carlisle Barracks, Pa.

Orders Revoked

AMES, Edward S., 1st Lieut., Forest Hills, N. Y.
BAKER, Augustus L. L., Major, Dover, N. J.
BARRETT, Richard Henry, 1st Lieut., Rochester, Minn.
BEERNINK, Ernest Henry, Captain, Grand Haven, Mich.
EBERHARD, Theodore Philip, 1st Lieut., Columbus, Mo.
LECLERCQ, George Theodore, Captain, Boston.
McCULLOUGH, John Davis, 1st Lieut., East Knoxville, Tenn.
McHARDY, George Gordon, 1st Lieut., New Orleans.
MAGILL, Herbert Kelvin, 1st Lieut., Baltimore.
MAYORALL, Antonio, Major, New Orleans.
MENCHER, Edward Wallace, 1st Lieut., New York.
REICHARD-ESTEVEZ, William, 1st Lieut., Des Moines, Iowa.
SNYDER, Gordon Elias, 1st Lieut., New Milford, Pa.

FIRST CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, First Corps Area, which comprises the states of Maine, Vermont, New Hampshire, Rhode Island, Massachusetts and Connecticut:

BARTON, Lewis W., 1st Lieut., Lexington, Mass., Manchester, N. H.
BLOCK, Herman L., 1st Lieut., Boston, Fort Williams, Maine.
BLOOMENTHAL, John, 1st Lieut., Burlington, Vt., Camp Forrest, Tenn.
DURGIN, Lawrence N., Captain, Amherst, Mass., Camp Edwards, Mass.
FOX, Nathan S., Captain, Manchester, N. H., Camp Forrest, Tenn.
FREEDMAN, Jacob P., Captain, Boston, Fort Oglethorpe, Ga.
GELLER, Philip S., 1st Lieut., Newport, R. I., Fort Adams, R. I.
HARRINGTON, Francis Y., Captain, West Hartford, Conn., Fort Oglethorpe, Ga.
HOVENANIAN, Michael S., 1st Lieut., Cambridge, Mass., Fort Oglethorpe, Ga.
JUDD, Lester E., 1st Lieut., Enosburg Falls, Vt., Fort Oglethorpe, Ga.
KREIDBERG, Marshall B., 1st Lieut., Dorchester, Mass., Fort Devens, Mass.
LOUGHRAN, James Frederick, 1st Lieut., Lowell, Mass., Hartford, Conn.
MANGANELLI, Charles Vincent, 1st Lieut., Topsfield, Mass., Camp Edwards, Mass.
NILES, John O., 1st Lieut., Osterville, Mass., Camp Edwards, Mass.
SMERZ, Anton, 1st Lieut., Worcester, Mass., Camp Forrest, Tenn.

Orders Revoked

ARCHAMBAULT, Armond C., Captain, Barre, Vt.
ARLEN, Richard P. S., 1st Lieut., Providence, R. I.
BARCOMB, Albert E., Lieut., Rochester, N. H.
BARD, Henry H., Captain, Boston.
BISHOP, Ernest W., 1st Lieut., East Providence, R. I.
CASHMAN, Justin L., 1st Lieut., North Haven, Conn.
CURTIS, Sprague, Lieut., M. R. C., Westfield, Mass.
DeWITT, Reginald F., 1st Lieut., Plymouth, N. H.

DOOLEY, Francis M., Captain, Portland, Maine.
DOYLE, George M., 1st Lieut., Gloucester, Mass.
DYE, William J. P., 1st Lieut., Wolfeboro, N. H.
ESTABROOK, John S., 1st Lieut., Brandon, Vt.
FINEBERG, Meyer H., Major, Boston.
FRANCESCHI, Aldo G., 1st Lieut., St. Johnsbury, Vt.
GALLERY, Daniel F., 1st Lieut., Fall River, Mass.
GARIPAY, Stanley L., 1st Lieut., Hartford, Conn.
GELLER, Philip S., 1st Lieut., Newport, R. I.
GINGOLD, Thomas L., Major, New Haven, Conn.
GLADSTONE, Arthur, 1st Lieut., Burlington, Vt.
GOODALL, Edwin B., Captain, Newton Centre, Mass.
HADFIELD, Jonathan P., Fall River, Mass.
HAMMER, Joseph, Lieut., M. R. C., Wellesley, Mass.
HARDY, Wilbert C., Lieut. Col., Haverhill, Mass.
HERSEY, Thomas F., Lieut., M. R. C., Hamden, Conn.
HOBBS, Milford L., 1st Lieut., Burlington, Vt.
HOLMES, Everett B., 1st Lieut., Ludlow, Vt.
HUSSEY, Earle U., Captain, Lynn, Mass.
JARDINE, Ralph R., 1st Lieut., Lyndonville, Vt.
LEANI, Aldo, 1st Lieut., Barre, Vt.
LEVIN, Harold M., 1st Lieut., Burlington, Vt.
LISBON, Wallace, 1st Lieut., Providence, R. I.
MURPHY, Theodore P., 1st Lieut., Montpelier, Vt.
NATHAN, Edward M., 1st Lieut., Quincy, Mass.
NEWTON, Louis, 1st Lieut., Bridgeport, Conn.
OTIS, Carlos G., 1st Lieut., Townsend, Vt.
PERLEY, John R., 1st Lieut., Lakeport, N. H.
RAFFERTY, Francis B., 1st Lieut., Williamantic, Conn.
RICCIO, Joseph S., 1st Lieut., Hamden, Conn.
RICHTER, Waldemar G., Captain, Bedford, Mass.
ROBBINS, Albert I., 1st Lieut., Roxbury, Mass.
RYNARD, William M. W., 1st Lieut., Stamford, Conn.
SAIA, John L., 1st Lieut., Barre, Vt.
SELTZER, Joseph P., 1st Lieut., Fairfield, Maine.
SMITH, Deering G., Captain, Nashua, N. H.
SMITH, Gordon B., 1st Lieut., Rutland, Vt.
TUCKER, Arthur S., 1st Lieut., New Haven, Conn.
WIESNER, Ernest E., 1st Lieut., Brockton, Mass.
WILCOX, Lloyd M., 1st Lieut., Terryville, Conn.

SECOND CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Second Corps Area, which comprises the states of New York, New Jersey and Delaware:

ABARBANEL, Milton G., 1st Lieut., Jersey City, N. J., Air Base, Tallahassee, Fla.
ABELSON, Max M., 1st Lieut., New York, Fort Bragg, N. C.
ABRAHAM, Harry H., 1st Lieut., Long Beach, L. I., N. Y., Camp Shelby, Miss.
ADELSON, Edward R., 1st Lieut., New York, Induction Station, Fort Jay, N. Y.
AGATSTON, Howard, 1st Lieut., Brooklyn, Induction Station, Fort Jay, N. Y.
ALIBERTO, John E. V., 1st Lieut., Irvington, N. J., Induction Station, Fort Jay, N. Y.
ALPERT, Sidney, 1st Lieut., Lakewood, N. J., Basic Flying School, Macon, Ga.
ANHALT, James E., 1st Lieut., Brooklyn, Camp Shelby, Miss.
ARONSON, Philip, 1st Lieut., Brooklyn, Fort Jackson, S. C.
BARTONE, Noel F., 1st Lieut., New York, Fort Jackson, S. C.
BATTAGLIA, Dominic, 1st Lieut., Johnstown, N. Y., West Point, N. Y.

BETTLE, Ronald A., 1st Lieut., Hackensack, N. J., Camp Shelby, Miss.
BLOOMENTHAL, Sanford R., 1st Lieut., Trenton, N. J., Air Base, Orlando, Fla.
BORKOW, Philip S., 1st Lieut., Brooklyn, Savannah Air Base, Savannah, Ga.
BROWN, Reeve M., 1st Lieut., Williamsville, N. Y., Fort Niagara, N. Y.
BUCHBINDER, Murray W., Captain, Jamaica, L. I., N. Y., Induction Station, Trenton, N. J.
BUNTING, John J., 1st Lieut., Clifton, N. J., Air Base, Meridian, Miss.
CACECI, Thomas G., 1st Lieut., New York, Mitchel Field, N. Y.
CARABELLI, Amilcare A., Captain, Trenton, N. J., Induction Station, Fort Jay, N. Y.
CARRIER, Russell N., 1st Lieut., Astoria, N. Y., Induction Station, Trenton, N. J.
CART, Harry, Captain, New York, Camp Shelby, Miss.
CAVANAGH, James E., 1st Lieut., New York, Air Base, Tallahassee, Fla.
CHAPMAN, David H., 1st Lieut., Syracuse, N. Y., Mitchel Field, N. Y.
CICHON, Elmer J., 1st Lieut., Clifton, N. J., Air Base, Orlando, Fla.
COLBURN, Russell F., 1st Lieut., Syracuse, N. Y., Mitchel Field, N. Y.
COLETTI, Cataldo J., 1st Lieut., New York, Induction Station, Fort Jay, N. Y.

CONAN, Mark Edwin, 1st Lieut., Syracuse, N. Y., Mitchel Field, N. Y.
COPPOLA, Santo T., 1st Lieut., New York, Air Base, Jackson, Miss.
COVE, Arthur M., 1st Lieut., Brooklyn, Fort Totten, N. Y.
CRANE, Donald V., 1st Lieut., Buffalo, Fort Bragg, N. C.
DeHOFF, John N., 1st Lieut., Flushing, L. I., N. Y., Camp Shelby, Miss.
DELSON, Barnett, 1st Lieut., Brooklyn, Advanced Flying School, Selma, Ala.
DOBRAK, Alfred H., 1st Lieut., Buffalo, Fort Bragg, N. C.
DOLLIN, Martin, 1st Lieut., Brooklyn, Induction Station, Trenton, N. J.
EARP, Ralph K., 1st Lieut., New York, Induction Station, Trenton, N. J.
EDISON, Earl M., 1st Lieut., New York, Fort Dix, N. J.
FAGIN, Irving, 1st Lieut., New York, Advanced Flying School, Albany, Ga.
FEARNS, Thomas J., 1st Lieut., Williston Park, N. Y., Camp Shelby, Miss.
FEDER, Edward P., 1st Lieut., Mount Vernon, N. Y., Camp Forrest, Tenn.
FEELY, Edward J., 1st Lieut., Brooklyn, Induction Station, Fort Jay, N. Y.
FEIDELMAN, Milton J., 1st Lieut., Brooklyn, Camp Claiborne, La.
FEINSTEIN, Herman, 1st Lieut., Hempstead, N. Y., Advanced Flying School, Selma, Ala.
FERDMAN, Philip, 1st Lieut., Brooklyn, Camp Shelby, Miss.
FERTIG, Samuel, 1st Lieut., Brooklyn, Air Base, Baton Rouge, La.
FEUER, Abe L., 1st Lieut., New York, Elgin Field, Valparaiso, Fla.
FIANDACA, Patsy M., Jr., 1st Lieut., Poughkeepsie, N. Y., Induction Station, Trenton, N. J.
FISHMAN, Sidney A., 1st Lieut., Flushing, L. I., N. Y., Fort Bragg, N. C.
FRANK, Lawrence F., 1st Lieut., Brooklyn, Fort Bragg, N. C.
FREEDMAN, Harry L., 1st Lieut., Plattsburg, N. Y., Plattsburg Barracks, N. Y.
FRIEDENBERG, Zachary B., 1st Lieut., New York, Fort Benning, Ga.
FRIEDMAN, Gerald J., 1st Lieut., New York, Fort Jackson, S. C.
GAGNIER, Gerald E., 1st Lieut., Churubusco, N. Y., Fort Bragg, N. C.
GIPSTEIN, Milton F., 1st Lieut., Schenectady, N. Y., West Point, N. Y.
GLEASON, Robert L., 1st Lieut., New York, Camp Shelby, Miss.
GOLDENSOHN, Eli S., 1st Lieut., New York, Air Base, Orlando, Fla.
GOLDSTEIN, Daniel L., 1st Lieut., New York, Savannah Air Base, Savannah, Ga.
GRANT, Charles P., 1st Lieut., Bloomfield, N. J., Eglin Field, Fla.
GREENBLAT, Bernard, 1st Lieut., Brooklyn, Fort Dix, N. J.
HAUSER, Saul S., 1st Lieut., Brooklyn, Air Base, Augusta, Ga.
HELLEN, Sydney L., 1st Lieut., New York, Advanced Flying School, Selma, Ala.
HELLMAN, Sidney J., 1st Lieut., New York, Camp Forrest, Tenn.
HERTZMARK, Frederic, 1st Lieut., New York, Camp Shelby, Miss.
HYMES, A. Leonard, 1st Lieut., Brooklyn, Savannah Air Base, Savannah, Ga.
IANNONE, Angelo B., 1st Lieut., Orange, N. J., Air Base, Meridian, Miss.
INCIARDI, James A., Captain, Brooklyn, Induction Station, Fort Jay, N. Y.
JERUSS, Edward G., 1st Lieut., Jamaica, L. I., N. Y., Savannah Air Base, Savannah, Ga.
KAHN, Samuel, 1st Lieut., Brooklyn, Induction Station, Trenton, N. J.
KASS, Herman, 1st Lieut., New York, Elgin Field, Valparaiso, Fla.
KATZ, Isadore, 1st Lieut., New York, Fort Bragg, N. C.
KENNY, James J., 1st Lieut., Orange, N. J., Fort Bragg, N. C.
KLEIN, Joseph, 1st Lieut., Brooklyn, Savannah Air Base, Savannah, Ga.
KLEIN, William S., 1st Lieut., Brooklyn, Fort Jackson, S. C.
KNUDSEN, Arnold F., 1st Lieut., Brooklyn, Air Base, Augusta, Ga.
KRUGMAN, Saul, 1st Lieut., Brooklyn, Advanced Flying School, Selma, Ala.
LANGSAM, Abraham A., 1st Lieut., Brooklyn, Induction Station, Fort Jay, N. Y.
LEIBOWITZ, Sidney, 1st Lieut., New York, Air Base, West Palm Beach, Fla.
LEVENTHAL, Louis, 1st Lieut., Brooklyn, Elgin Field, Valparaiso, Fla.
LUDWIG, Nathan B., 1st Lieut., Brooklyn, Advanced Flying School, Selma, Ala.
LUFTON, Albert M., 1st Lieut., Lewes, Del., Camp Shelby, Miss.
LYNN, Hugh B., 1st Lieut., Verona, N. J., Air Base, Tallahassee, Fla.

MAGEE, William G., 1st Lieut., New York, Induction Station, Fort Jay, N. Y.
MARCUS, Herbert R., 1st Lieut., New York, Induction Station, Trenton, N. J.
MIZROCH, Solomon B., 1st Lieut., Englewood, N. J., Induction Station, Fort Jay, N. Y.
MORELEWICZ, Henry V., 1st Lieut., Buffalo, Fort Niagara, N. Y.
MOSKOWITZ, Eugene, 1st Lieut., Mount Vernon, N. Y., Camp Livingston, La.
NELSON, Irving, 1st Lieut., Brooklyn, Air Base, Jackson, Miss.
NESTOR, John O., 1st Lieut., Newton, N. J., Fort Jackson, S. C.
NIED, Richard E., 1st Lieut., Rochester, N. Y., Fort Bragg, N. C.
OLSSON, Ewald E., Major, Brooklyn, Camp Claiborne, La.
OSTROVE, Lester L., 1st Lieut., New York, Air Base, Jackson, Miss.
PALMIERI, Joseph F., 1st Lieut., Brooklyn, Air Base, Jackson, Miss.
PATTERSON, Barnard D., 1st Lieut., Queens Village, N. Y., Camp Stewart, Ga.
PERILLO, Januarius A., 1st Lieut., Olean, N. Y., Fort Niagara, N. Y.
PESKIN, Aaron R., Captain, New York, Induction Station, Fort Jay, N. Y.
PUERNER, Joseph W., 1st Lieut., Buffalo, Fort Niagara, N. Y.
RAIFMAN, Herman M., 1st Lieut., Brooklyn, Basic Flying School, Macon, Ga.
RAPAPORT, Henry, 1st Lieut., Whitney Point, N. Y., Mitchel Field, N. Y.
RAPAPORT, Irving, 1st Lieut., Rego Park, L. I., N. Y., Basic Flying School, Macon, Ga.
RAY, Claud B., Captain, Bayside L. I., N. Y., Fort McClellan, Ala.
RENAUD, Oliver Vernon, 1st Lieut., Brooklyn, Camp Shelby, Miss.
RHODES, Harmon T., Jr., 1st Lieut., New York, Induction Station, Trenton, N. J.
ROLAND, Paul S., Captain, New York, Induction Station, Trenton, N. J.
SCHAFFNER, Bertram, 1st Lieut., New York, Induction Station, Fort Jay, N. Y.
SCHER, David, 1st Lieut., Jamaica, L. I., N. Y., Air Base, Jackson, Miss.
SCHUTZ, Sigmund, 1st Lieut., New York, Induction Station, Trenton, N. J.
SCHWETZER, Martin, 1st Lieut., New York, Air Base, Baton Rouge, La.
SELTZ, Herman, 1st Lieut., Brooklyn, Mitchel Field, N. Y.
SHAPIRO, Lester, 1st Lieut., New York, Air Base, Meridian, Miss.
SHERBER, Daniel A., 1st Lieut., Brooklyn, Air Base, Baton Rouge, La.
SHINE, Louis B., 1st Lieut., New York, Fort Jackson, S. C.
SIMENSKY, Philip F., 1st Lieut., Brooklyn, Air Base, Orlando, Fla.
SPINELLI, Vincent A., 1st Lieut., Sunnyside, L. I., N. Y., Mitchel Field, N. Y.
SPIVACK, Seymour E., 1st Lieut., Elizabeth, N. J., Eglin Field, Fla.
STURMAN, William A., 1st Lieut., New York, Fort Jay, N. Y.
SUFFNESS, Gustave, 1st Lieut., Elizabeth, N. J., Fort Bragg, N. C.
SWIRE, Howard, Captain, Brentwood, L. I., N. Y., Fort Monmouth, N. J.
TABBAT, Samuel F., 1st Lieut., New York, Air Base, West Palm Beach, Fla.
TAYLOR, James A., 1st Lieut., Kings Park, L. I., N. Y., Pine Camp, N. Y.
THWAITE, Walter G., 1st Lieut., Brooklyn, Fort Jay, N. Y.
TRUBOWITZ, Sidney, 1st Lieut., Brooklyn, Fort Jackson, S. C.
TRUTT, Irving, 1st Lieut., Brooklyn, Fort Jackson, S. C.
VALENTE, Michael A., 1st Lieut., Strykersville, N. Y., Fort Benning, Ga.
VAN GORDER, Charles O., 1st Lieut., Hackensack, N. J., Fort Bragg, N. C.
VARON, Leo R., 1st Lieut., New York, Air Base, West Palm Beach, Fla.
WADSWORTH, John H., 1st Lieut., Cobleskill, N. Y., West Point, N. Y.
WALDORF, Frank B., 1st Lieut., Syracuse, N. Y., Mitchel Field, N. Y.
WANDERMAN, Sidney E., 1st Lieut., New York, Fort Benning, Ga.
WARREN, Harold D., 1st Lieut., Brooklyn, Fort Jay, N. Y.
WEINRAUB, Edwin C., 1st Lieut., New York, Savannah Air Base, Savannah, Ga.
WOODWORTH, John Albert, 1st Lieut., Syracuse, N. Y., Mitchel Field, N. Y.
ZELLER, Harry N., 1st Lieut., New York, Fort Jackson, S. C.
ZUCKERMAN, Hyman, 1st Lieut., Brooklyn, Savannah Air Base, Ga.

THIRD CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Third Corps Area, which comprises the states of Pennsylvania, Virginia, District of Columbia and Maryland:

ASHBURY, Howard Elmer, Lieut. Col., Baltimore, Headquarters 3d Corps Area, Baltimore.
BAKER, Howard Walter, 1st Lieut., Philadelphia, Indiantown Gap Military Reservation, Indiantown Gap, Pa.
BAVENDAM, Frederick Arnold, Jr., 1st Lieut., Philadelphia, Fort George G. Meade, Md.
BIRKEL, Benedict Herman, 1st Lieut., Harrisburg, Pa., Camp Lee, Va.
BENSON, Paul John, 1st Lieut., Punxsutawney, Pa., Indiantown Gap Military Reservation, Indiantown Gap, Pa.

BLAIR, Joseph Richard, 1st Lieut., Slovan, Pa., Indiantown Gap Military Reservation, Indiantown Gap, Pa.
BOOKER, Daniel Coleman, 1st Lieut., Richmond, Va., Fort Eustis, Va.
BORDEN, Daniel LeRay, Lieut. Col., Washington, D. C., Fort George G. Meade, Md.
BRADY, Fred Charles, 1st Lieut., Charleroi, Pa., Camp Lee, Va.
BROWN, Joseph Donald, 1st Lieut., Philadelphia, Indiantown Gap Military Reservation, Pa.
BOYER, Randal Allen, 1st Lieut., Philadelphia, Fort Monroe, Va.
BRYER, Benjamin Franklin, 1st Lieut., Pittsburgh, Fort Eustis, Va.
BROWN, Brooks Gideon, Jr., 1st Lieut., Silver Springs, Md., Fort George G. Meade, Md.
BROWN, George Henderson, 1st Lieut., Philadelphia, Aberdeen Proving Ground, Md.
CAMPBELL, Thomas Anthes, 1st Lieut., Philadelphia, Fort Eustis, Va.
CARMICHAEL, John Randolph Tucker, 1st Lieut., Charlottesville, Va., Fort George G. Meade, Md.

CATHCART, Hugh, 1st Lieut., Philadelphia, Indiantown Gap Military Reservation, Pa.
 CLAPP, John Sidney, 1st Lieut., Pittsburgh, Fort George G. Meade, Md.
 CURTIS, Leo Michael, 1st Lieut., Baltimore, Camp Lee, Va.
 DETUERK, John Jacob, 1st Lieut., Philadelphia, Camp Lee, Va.
 DOLOWITZ, David Augustus, 1st Lieut., Baltimore, Camp Lee, Va.
 DOW, Charles Harris, 1st Lieut., Chilhowie, Va., Fort George G. Meade, Md.
 DUTLINGER, Robert Peck, 1st Lieut., Mount Union, Pa., Indiantown Gap Military Reservation, Indiantown Gap, Pa.
 FIEDLER, Howard Taft, 1st Lieut., Philadelphia, Edgewood Arsenal, Md.
 FITZGERALD, Robert Peter Francis, 1st Lieut., Ardmore, Pa., Fort George G. Meade, Md.
 FULTZ, George Simeon, Jr., 1st Lieut., Butterworth, Va., Camp Lee, Va.
 GATES, Earle Carlton, Captain, Chesterfield, Va., Indiantown Gap Military Reservation, Indiantown Gap, Pa.
 GLASSBURN, Edward Myler, 1st Lieut., Pittsburgh, Fort Eustis, Va.
 GODFREY, James Timothy, Jr., 1st Lieut., Washington, D. C., Fort George G. Meade, Md.
 HARRELL, Jerome Blaine, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.
 HAVERTY, Eugene Francis, 1st Lieut., Pittsburgh, Indiantown Gap Military Reservation, Indiantown Gap, Pa.
 HILES, Charles Hall, 1st Lieut., Edgewood, Pa., Carlisle Barracks, Pa.
 HILLMAN, Samuel Alvin, 1st Lieut., Washington, D. C., Indiantown Gap Military Reservation, Indiantown Gap, Pa.
 HINES, Brainard Evans, 1st Lieut., Richmond, Va., Fort George G. Meade, Md.
 JARVIS, Jack Reynolds, 1st Lieut., Towson, Md., Fort Eustis, Va.
 JOHNS, Sydney Lloyd, 1st Lieut., Wilkinsburg, Pa., Indiantown Gap Military Reservation, Indiantown Gap, Pa.
 JONES, Donald Emerson, 1st Lieut., Mount Pleasant, Pa., Indiantown Gap Military Reservation, Pa.
 KANNAPEL, Alan Robert, 1st Lieut., Lehigh, Pa., Indiantown Gap Military Reservation, Indiantown Gap, Pa.
 Lo GRIPPO, Gerald Anthony, 1st Lieut., Norristown, Pa., Fort George G. Meade, Md.
 MANTZ, Frank Alphonso, Jr., 1st Lieut., Philadelphia, Fort George G. Meade, Md.
 MASON, John Henry, Jr., 1st Lieut., Mayview, Pa., Aberdeen Proving Ground, Md.
 MENDELSSOHN, Edwin, 1st Lieut., Ashland, Pa., Indiantown Gap Military Reservation, Indiantown Gap, Pa.
 MEYERS, Robert Paul, 1st Lieut., Richmond, Va., Fort Story, Va.
 OMBRES, Severn Richard, 1st Lieut., Meadville, Pa., Indiantown Gap Military Reservation, Indiantown Gap, Pa.
 O'NEILL, Hugh Aloysius, 1st Lieut., Pittsburgh, Aberdeen Proving Ground, Md.

OWEN, John Keller, 1st Lieut., Baltimore, Fort George G. Meade, Md.
 PRESSMAN, Robert Sydney, 1st Lieut., Philadelphia, Fort Story, Va.
 PRESTON, Henry Grant, 1st Lieut., Harrisonburg, Va., Fort Story, Va.
 RAPEE, Lawrence Albert, 1st Lieut., Washington, D. C., Aberdeen Proving Ground, Md.
 REYNOLDS, Kenneth Earl, Captain, Waynesboro, Pa., Indiantown Gap Military Reservation, Indiantown Gap, Pa.
 RICE, John Sidney, 1st Lieut., Baltimore, Aberdeen Proving Ground, Md.
 RIPP, Jacob, 1st Lieut., Pittsburgh, Fort George G. Meade, Md.
 SAGERSON, Robert Patrick, 1st Lieut., Johnstown, Pa., Indiantown Gap Military Reservation, Pa.
 SANFORD, Frederick Edmundson, Captain, Sayre, Pa., Aberdeen Proving Ground, Md.
 SMITH, James Fulton, 1st Lieut., Clearfield, Pa., Indiantown Gap Military Reservation, Indiantown Gap, Pa.
 SOLOMON, Cyril, 1st Lieut., Baltimore, Edgewood Arsenal, Md.
 UDEGRAFF, Harry Beshore, 1st Lieut., Millersburg, Pa., Indiantown Gap Military Reservation, Indiantown Gap, Pa.
 URBATIS, Peter William, 1st Lieut., Wernersville, Pa., Camp Lee, Va.
 WAGNER, Charles Andrew, Captain, Baltimore, Edgewood Arsenal, Md.
 WELEBIR, Andrew John, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.
 WIBLE, Harvey Glenn, 1st Lieut., Monessen, Pa., Edgewood Arsenal, Md.
 WILSON, John McCullough, Jr., 1st Lieut., Pittsburgh, Camp Davis, N. C.
 WOLDOW, Irving, 1st Lieut., Philadelphia, Aberdeen Proving Ground, Md.

Orders Revoked

CALL, Manfred, III, 1st Lieut., Richmond, Va.
 DEAN, James Seay, Captain, Pennhurst, Pa.
 DODD, William Anthony, 1st Lieut., Baltimore.
 DOLOWITZ, David Augustus, 1st Lieut., Baltimore.
 FIORE, Charles Nicholas, 1st Lieut., Brentwood, Md.
 FOSTER, John Van Valzah, 1st Lieut., Harrisburg, Pa.
 FULTZ, George Simeon, Jr., 1st Lieut., Butterworth, Va.
 GRIER, George Smith, III, 1st Lieut., Baltimore.
 HEIMOFF, Leonard Lincoln, 1st Lieut., Baltimore.
 LAURENT, August Aloysius, 1st Lieut., Avella, Pa.
 MITCHELL, Edward Albert, 1st Lieut., Clinchco, Va.
 OWEN, Robert Franklin, 1st Lieut., Washington, D. C.
 PROKOP, Albert George, 1st Lieut., Clairton, Pa.
 QUINONES-CHACON, Pascasio, 1st Lieut., Baltimore.
 ROTHERMEL, John Keim, 1st Lieut., Strausstown, Berks County, Pa.
 SCHIAN, Louis, 1st Lieut., Lewisburg, Pa.
 SNIDER, George Everett, 1st Lieut., Richmond, Va.
 WILLIAMS, Ben Clayton, 1st Lieut., Baltimore.
 YOUNG, Frederick Frick, 1st Lieut., Summerville, Pa.

FOURTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Fourth Corps Area, which comprises the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana:

ADAMS, John W., Jr., 1st Lieut., Nashville, Tenn., Camp Claiborne, La.
 AKENHEAD, Walton R., 1st Lieut., New Orleans, Camp Claiborne, La.
 ANNIS, Leonard S., 1st Lieut., Tampa, Fla., Camp Claiborne, La.
 BAUGH, Wendell P., Major, Decatur, Ala., Camp Livingston, La.
 BLACK, Millard W., 1st Lieut., Columbus, Ga., Camp Livingston, La.
 BROWN, Randall Gay, 1st Lieut., Graymont, Ga., Camp Davis, N. C.
 CANNON, Eugene B., 1st Lieut., Asheboro, N. C., Camp Croft, S. C.
 CARMOUCHE, Ernest N., 1st Lieut., Crowley, La., Fort Oglethorpe, Ga.
 CARRIER, Everett Eugene, 1st Lieut., Fountain City, Tenn., Fort Bragg, N. C.
 CHERRY, Alfred, 1st Lieut., Birmingham, Ala., Fort Jackson, S. C.
 CLARK, Arthur Lee, 1st Lieut., Iowa, La., Camp Livingston, La.
 COBB, John Massey, 1st Lieut., Tuskegee, Ala., Camp Shelby, Miss.
 COX, Marcus Edward, 1st Lieut., Charleston, S. C., Fort Benning, Ga.
 DEERE, Charles J., 1st Lieut., Memphis, Tenn., Fort McPherson, Ga.
 DUNSTAN, Paul L., 1st Lieut., Atlanta, Ga., Fort Benning, Ga.
 EBERHART, Charles A., 1st Lieut., Atlanta, Ga., Camp Croft, S. C.
 EHLERT, William E., 1st Lieut., New Orleans, Camp Polk, La.
 GAGER, Leslie Tracy, Major, Bay Pines, Fla., Camp Shelby, Miss.
 GAHAGAN, Henry Cole, 1st Lieut., Alexandria, La., Camp Polk, La.
 GIFFORD, John Pearl, 1st Lieut., Vero Beach, Fla., Fort Screven, Ga.
 GILLIAND, Harold L., 1st Lieut., Nashville, Tenn., Fort Benning, Ga.
 HAIK, George Michel, 1st Lieut., New Orleans, Fort Jackson, S. C.
 HARRIS, William T., 1st Lieut., Troy, N. C., Camp Davis, N. C.
 HASTE, James L., Captain, Electric Mills, Miss., Fort Oglethorpe, Ga.
 HEATH, William H., Jr., 1st Lieut., Atlanta, Ga., Camp Claiborne, La.
 HINTON, Andrew H., 1st Lieut., Miami, Fla., Fort Oglethorpe, Ga.
 HOLBROOK, Joseph S., 1st Lieut., Statesville, N. C., Fort Bragg, N. C.
 HOUSHOLDER, Charles H., 1st Lieut., Memphis, Tenn., Fort Oglethorpe, Ga.
 HOWELL, James Marcus, 1st Lieut., New Iberia, La., Camp Livingston, La.
 HUGHES, John Davis, Captain, Memphis, Tenn., Fort Oglethorpe, Ga.

HUNTER, John F. C., 1st Lieut., Magnolia, N. C., Fort Oglethorpe, Ga.
 JENKINS, Hughes B., Major, Dnalsnsonville, Ga., Camp Livingston, La.
 KELLEY, Oscar Lee, 1st Lieut., Ralford, Fla., Fort Oglethorpe, Ga.
 KING, Charles M., 1st Lieut., Natchitoches, La., Fort Jackson, S. C.
 LANGLEY, Francis H., Major, St. Petersburg, Fla., Camp Croft, S. C.
 LOVELESS, James A., 1st Lieut., Nashville, Tenn., Fort Benning, Ga.
 PATTERSON, Joseph H., 1st Lieut., Nashville, Tenn., Fort McPherson, Ga.
 PHILLIPS, Herbert S., 1st Lieut., Holly Springs, Miss., Fort McPherson, Ga.
 SCANLON, John Joseph, 1st Lieut., Winter Gardens, Fla., Fort McPherson, Ga.
 SCHAPIRO, Mark Meyer, 1st Lieut., Birmingham, Ala., Fort McPherson, Ga.
 STEWART, Marcus J., 1st Lieut., Memphis, Tenn., Fort McPherson, Ga.
 WALKER, Richard H., Jr., Captain, Orlando, Fla., Fort Benning, Ga.
 WARR, Otis S., Jr., 1st Lieut., Memphis, Tenn., Camp Claiborne, La.
 WHITE, Henry C., 1st Lieut., LaFayette, La., Fort McPherson, Ga.
 WILSON, Harry F., Major, Columbia, S. C., Fort George G. Meade, Md.

Orders Revoked

BASS, Beaty Lee, 1st Lieut., Winston-Salem, N. C.
 CROFT, Theodore G., Lieut. Col., Jacksonville, Fla.
 DASPIT, Dudley Joseph, 1st Lieut., Montgomery, Ala.
 FARRIOR, James Harvey, 1st Lieut., Montgomery, Ala.
 GRAY, Cyrus L., Jr., 1st Lieut., Durham, N. C.
 HIGHTOWER, Russell G., Captain, Birmingham, Ala.
 HOLBROOK, Joseph S., 1st Lieut., Statesville, N. C.
 McCULLOUGH, George C., 1st Lieut., Birmingham, Ala.
 McLAURIN, James W., 1st Lieut., Baton Rouge, La.
 STABLER, Ernest V., 1st Lieut., Greenville, Ala.
 VARINO, George A., 1st Lieut., Monroe, La.
 WHITLEY, James Roger, 1st Lieut., Chattanooga, Tenn.

CORRECTION

Lieutenant Manns.—In the Medical Preparedness section of THE JOURNAL, May 31, page 2513, under the Fourth Corps Area, the name 1st Lieut. John Adam Banns should have been printed 1st Lieut. John Adam Manns.

ORGANIZATION SECTION

MEDICAL AND SURGICAL CARE, INC., UTICA, N. Y.

The Medical and Surgical Care, Inc., is a nonprofit medical expense indemnity plan incorporated to provide cash indemnity insurance for medical service to subscribers in the following counties in New York: Chenango, Clinton, Essex, Franklin, Fulton, Herkimer, Lewis, Madison, Montgomery, Oneida and St. Lawrence.

Medical and Surgical Care, Inc., was the first medical expense indemnity plan to obtain a permit to operate under the provisions of article IX-C of the New York insurance laws. This recent amendment to the New York insurance laws provides that such medical expense indemnity plans shall operate under the supervision of the New York State Department of Insurance and the State Department of Social Welfare.

All employed persons and their dependents living in the counties mentioned who are subscribers of Hospital Plan, Inc., the hospital service plan in that area, are eligible to enroll in groups of five or more to the Medical and Surgical Care Plan. Subscribers have free choice of physician. Persons over 65 years old are not eligible for membership. Married women are not accepted unless their husbands are members of the plan.

The plan offers two contracts. One contract covers medical services in hospital, office or home, the other is limited to indemnity for medical services in a hospital only. The services provided under each contract and the premium rates are as follows:

CONTRACT I. MEDICAL AND SURGICAL CARE IN THE HOSPITAL, OFFICE OR HOME

Benefits:

- \$225 limit for any person entitled to receive benefits hereunder.
- \$325 limit for any two persons in one family entitled to receive benefits hereunder.
- \$425 limit for any three persons or more in one family (but not over \$225 for any one person) entitled to receive benefits hereunder.
- Twelve maternity postpartum calls, necessary antepartum care and delivery. Also care of newborn baby for twelve days.
- Thirty therapy treatments, one half the cost to be paid by the plan for each person enrolled.
- No limit of anesthesia for any enrolled person.
- \$ 75 for physicians', surgeons' or osteopaths' calls in home, office or hospital for each person enrolled, in addition to maternity and surgery.
- \$ 50 of x-ray diagnosis for each enrolled person.
- \$ 50 of x-ray therapy and radium treatments for each person enrolled.
- \$ 35 of laboratory examinations in office or hospital for each person enrolled.
- \$100 limit of tests and treatments for allergy, one half the cost to be paid by the plan for each person enrolled.
- \$225 of surgery for any one person enrolled.

In case of hospitalization anywhere, the attending physician, surgeon or osteopath must be acceptable to the hospital before practicing therein.

Deductible Clause:

During the first contract year the first \$6 of expense for illness, examination and treatment for any one family must be paid by the subscriber. Subsequently the cost of the first two home or office calls of each separate illness is paid by the subscriber.

Cost:

	Month	Quarter
Gainfully employed subscriber.....	\$1.40	\$4.20
Spouse and each dependent from the ages of 16 through 18 years.....	1.15	3.45

All children between the ages of 1 and 16 years.....	0.75	2.25
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(This one payment covers all children under 16 years regardless of number.)

CONTRACT II. MEDICAL AND SURGICAL CARE IN THE HOSPITAL ONLY

Benefits:

- \$225 limit for any one person entitled to receive benefits hereunder.
- \$325 limit for any two persons in one family entitled to receive benefits hereunder.
- \$425 limit for any three persons in one family (but not over \$225 for any one person) entitled to receive benefits hereunder.
- Twelve maternity postpartum calls, necessary antepartum care and delivery. Also care of newborn baby for twelve days.
- \$ 25 for anesthesia services for each one enrolled.
- \$ 40 of physicians' calls in an approved hospital for medical illness for each one enrolled, in addition to maternity and surgery after-care.
- \$20 of physicians' calls in home or office when necessary within thirty days after discharge from the hospital for each person enrolled.
- \$ 25 of x-ray services and radium treatments for each person enrolled.
- \$ 25 of laboratory examinations in the hospital for each person enrolled.
- \$225 of surgery for any one person enrolled.

In case of hospitalization anywhere, the attending physician, surgeon or osteopath must be acceptable to the hospital before practicing therein.

Deductible Clause:

The first \$10 of the expense of illness, examinations and treatment for each family enrolled is paid by the subscriber, when a subscribing member is hospitalized.

Cost:

	Month	Quarter
Gainfully employed subscriber.....	\$0.80	\$2.40
Spouse and each dependent from 16 through 18 years.....	.75	2.25
All children of subscriber 1 to 16 years..	.65	1.80

(This one payment covers all children under 16 years regardless of number.)

Exclusions Under Both Contracts:

1. Care resulting from recent pregnancy, occurring prior to issuance of contract.
2. Maternity and antepartum care, hernia, tonsillectomies, occurring within ten months of effective contract date.
3. Care available for subscribers by compensation.
4. Drugs, medicine, dentistry, eye glasses and appliances not usually furnished by physician.
5. Services of more than one physician at one time.
6. Any added fee that physicians usually charge for calls made after 10 p. m.
7. Blood transfusions are included, but not payments to donor or cost of blood matching.
8. Services will not be rendered for conditions, diseases or ailments existing at time of subscriber's application. Those may not enroll who had, prior to joining plan, cancer, diabetes, osteomyelitis, chronic nephritis, coronary thrombosis, pernicious anemia or insanity.

Physicians are paid by the plan for services rendered to subscribers according to a fixed schedule of fees. These fees are approximately the same as those paid under the workmen's compensation law. The agreement between the participating physicians and the Medical and Surgical Care, Inc., provides that if at the end of any monthly accounting period the corporation does not have sufficient funds to pay all claims against it, the corporation, after deducting for operating expenses for the following month and paying creditors, other than participating physicians, will then pay the claims of the participating physicians on a pro rata basis. Physicians are paid directly by the plan and subscribers are indemnified with a receipted bill for the medical and surgical services they have received.

The managing director, H. B. Stephenson, of the Hospital Plan, Inc., of Utica, N. Y., is also managing director of the Medical and Surgical Care, Inc., and the enrolments for the two plans are handled by the same office, although separate accounts are maintained for each plan. At present only subscribers to the Hospital Plan are solicited for the Medical Plan.

The Hospital Plan also sent out nearly 50,000 questionnaires regarding a nonprofit medical plan. Over 80 per cent of the cards were returned, showing interest in the plan. The Hospital

Plan offered facilities of office, personnel and equipment without charge excepting for out of pocket expense. This offer also agreed that, after the enrolment of 5,000 subscribers in the Medical Plan, expenses would be prorated between the Hospital Plan and the Medical Plan.

The by-laws state that at least one third of the directors shall be persons other than physicians and at least one third shall be physicians duly licensed to practice in the state of New York. At present ten out of eighteen directors are physicians.

Subscribers have free choice of physicians. Participating physicians agree to accept as complete remuneration for their services the payment provided by the plan. Other physicians, either not participating or in localities where the plan is not licensed to operate, may be given two thirds of the payment according to the plan's fee schedule and may then charge the patient an additional fee to cover the remainder of their services.

The plan went into operation in April 1940, and up to the present time it has been possible to balance the books without drawing on lines of credit available. Membership has passed the 2,000 mark and is being extended to new localities as fast as arrangements can be completed.

MEDICAL ECONOMIC ABSTRACTS

PROBLEMS OF AMERICA'S NEEDY FARMERS

"Our farm population is steadily growing" says the Report of the Administrator of the Farm Security Administration for 1940. Each year that population is increasing by about 445,000 youths. This increase is highest in the poorest counties—in the Appalachians, the Cotton Belt, Cut-Over section, the Great Plains and the Southwest. There is no corresponding increase in the demand for laborers in urban localities, and there is no room for additional farmers on the land. In fact, available farm land is shrinking through erosion. Mechanization and improvements in seed, breeding stock and general farm practices are reducing the demand for farmers on the available farms.

The Farm Security Administration has been trying to meet this with a program of rehabilitation by which more than a million families have been helped to a new start. This work is done by education and by loans, which in 1940 amounted to \$93,000,000 to 286,000 families. Since the beginning of the program in 1935, \$507,368,664 has been lent to 856,024 families. Although much of this money has not yet fallen due, \$152,386,930 had been collected on principal due up to June 30, 1940, and it is estimated that at least 80 per cent of all the money lent will eventually be repaid.

Because it was found that sickness added greatly to the risks of repayment, a medical program has been "worked out in close cooperation with the state medical associations and local medical societies."

Every plan is founded on three basic principles: (1) Each family has a free choice of its physician from among the participating doctors; (2) fees are paid by every participating family at the beginning of the operating period and are held by a bonded trustee; (3) fees are based on the families' ability to pay, as indicated by their farm-management plans and records.

Benefits covered in the plan usually include (1) ordinary medical care, including examination, diagnosis and treatment in the home or in the office of the physician; (2) obstetric care; (3) ordinary drugs; (4) emergency surgery; (5) emergency hospitalization.

Dental services have been added in several localities.

The amounts paid for medical care vary widely, but "A typical payment schedule for medical care in a low income county is \$18 annually for man and wife plus \$1 for each child, the maximum payment being \$26 per family."

More than eighty thousand families have joined such plans in six hundred and thirty-four counties in thirty-one states. Medical care programs have also been organized on fifty-six

resettlement projects, and specialized programs have been developed for migrants in California and Arizona which are now being extended to the Pacific Northwest, Texas and Florida.

"A strong reviewing committee, drawn from the physicians' ranks, limits any possible abuses by the doctors. . . . Payments to physicians the country over average approximately 65 per cent of total bills presented."

STANDARD OIL NEW JERSEY MEDICAL SERVICE

The general company policy throughout the entire domestic organization, says the anniversary number of the *Medical Bulletin*, June 1941, of the Standard Oil Company of New Jersey, is that "diagnostic facilities only are available and employees are urged to consult their own family physicians for any form of treatment." Under this plan there was in 1940 "an average Lost-Time rate of 5.19 days per employee." This includes all time lost with no such "waiting period" deducted as is found in most such statistics. (It is less than half the rate for industrial employees insured under compulsory sickness insurance in Germany and Great Britain.) In the producing field department a prepayment medical and hospitalization plan has recently been inaugurated. Although this plan is underwritten by an outside insurance company, it is supervised by the medical department of the firm. This plan provides a cash benefit according to the following schedules:

Private Room: A maximum allowance of \$150 for hospital room for one disability, not to exceed \$5 a day.

Doctor's Fee: Up to \$3 per visit and up to \$45 a year. Employee entitled to home, office or hospital calls; dependents entitled to hospital calls only. Absence from work not necessary. Free choice of doctors.

Surgeon's Fees: Not to exceed \$75 surgeon's fee for major operation, and \$25 surgeon's fee in minor operation.

(Tonsillectomies come under minor operations.)
(The surgeon's fees include postoperative visits but do not include the hospital fees, which are \$10 for operating room, \$10 anesthetic and \$5 laboratory fee. These fees are paid in addition to the surgeon's fee.)

Operating room: Not to exceed \$10.

Anesthetic: Not to exceed \$10.

Laboratory fee: Not to exceed \$5. (excluding teeth).

Premium: \$2 a month per employee.

The plan is entirely voluntary and in the beginning, April 1, 1939, the employees were "rather cautious about participating." This resulted in adverse selection, and a drive to encourage enrolment was put on, and "it is expected that, by April 1, 1941, 75 per cent or more of the employees will have participated."

OFFICIAL NOTES

ADDRESSES BY OFFICIAL STAFF

DR. W. W. BAUER:

July 22—Conference of Health Officers of New York Metropolitan Area, Bethpage State Park, Nassau County, N. Y.

DR. MORRIS FISHBEIN:

July 26—Writers' Conference, Lake Forest, Ill.

July 29—County Medical Societies, Rotary and Kiwanis, Kane, Pa.

July 30—Interstate Medical Meeting, Chautauqua, N. Y.

ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES HELD IN CLEVELAND, JUNE 1-5, 1941

A full day meeting of the Board was held on Sunday, June 1, and meetings of shorter duration were held on other days during the week of the annual session.

COMMISSION ON PAN AMERICAN RELATIONS

The following commission was appointed by the Board, in accordance with the action of the House of Delegates, with regard to developing the annual session to be held in Atlantic City in 1942 as a Pan American meeting: Drs. W. A. Sawyer, New York; Hugh S. Cumming, Washington, D. C., and Howard R. Hartman, Rochester, Minn., and, ex officio, Drs. James A. Paullin, Atlanta, Ga.; Frank H. Lahey, Boston; Olin West, Chicago, and Morris Fishbein, Chicago.

SPANISH PERIODICAL

Tentative approval was given for the publication of a Spanish periodical to contain abstracts of material appearing in all of the Association's publications. Negotiations for this periodical are being carried on with the coordinator for Pan American affairs of the federal government. The periodical is to be circulated to the membership of the official medical societies in Central and South America, Cuba, Mexico and Puerto Rico.

ADDITION TO HEADQUARTERS BUILDING

Authorization was given for the erection of a three story and basement structure, 80 by 100 feet, at the east end of the headquarters building to provide for much needed office and storage space.

MEDICOPHARMACEUTIC CONFERENCE

The Board of Trustees directed the Council on Pharmacy and Chemistry to arrange for a medicopharmaceutic conference with a view to developing more definite relations and better cooperation between pharmacy and medicine.

APPOINTMENTS

Dr. James P. Leake was elected to succeed Dr. C. W. Edmunds on the Council on Pharmacy and Chemistry and Dr. Charles Glenville Giddings Jr. to succeed Dr. Isaac A. Abt on the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association.

HEALTH OF INTERNS

A report on the health of interns, prepared by the Council on Medical Education and Hospitals at the request of the Board of Trustees, was presented and was approved for publication in the Student Section of THE JOURNAL.

GIFT OF PORTRAIT OF DR. NATHAN SMITH DAVIS

The Board gratefully received from Mrs. John Davis Keals a portrait of Dr. N. S. Davis, which has been hung in the Assembly Hall at headquarters.

REPRESENTATIVES TO AMERICAN MUSEUM OF HEALTH

Drs. W. W. Bauer, Arthur W. Booth and Morris Fishbein were authorized to accept invitations to become members of the Scientific Advisory Board of the American Museum of Health.

PHYSICIANS FOR SERVICE IN GREAT BRITAIN

The Board authorized Dr. Fishbein to continue his cooperation with the American Red Cross in its endeavor to secure physicians for voluntary service with the British army and British emergency medical service.

APPOINTMENT OF OFFICERS AND COMMITTEES

The following officers and committees were appointed for the ensuing year: Chairman, Dr. Arthur W. Booth; Secretary, Dr. E. E. Irons; Executive Committee and Finance Committee, Drs. James R. Bloss (chairman), E. E. Irons and R. L. Sensenich; Committee on Scientific Exhibit: Drs. Roger I. Lee (chairman), E. L. Henderson and Ralph A. Fenton.

MISCELLANEOUS

Other matters too numerous to mention here were considered by the Board at its several meetings. Some of these, however, will be reported on later.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—H. R. 4965 has passed the House and the Senate, making appropriations for the Army for the fiscal year ending June 30, 1942. The Senate Committee on Appropriations recommended that the authorization for the employment of osteopaths as interns be deleted. On the floor of the Senate, however, the authorization was reinstated, principally on the insistence of Senator O'Mahoney of Wyoming. The authorization is permissive in form and will remain in force for a period of one year. H. R. 3484 has been reported to the House, providing that reserve officers of the Army who were called or ordered into active military service by the federal government for extended military service in excess of thirty days on or subsequent to Feb. 28, 1925, other than for service with the Civilian Conservation Corps, and who are now disabled from disease or injury contracted or received in line of duty while so employed shall be entitled to receive the same retirement pay and hospital benefits as are now or may hereafter be provided by law or regulation for officers of corresponding grades and length of service of the Regular Army.

Bills Introduced.—S. 1569, introduced by Senator Reynolds, North Carolina, proposes to amend the Soldiers' and Sailors' Civil Relief Act of 1940 to provide for the termination of leases covering property occupied for professional, business, agricultural or similar purposes where any such lease has been or may be executed on his own behalf by any person who is or may hereafter be in military service under the provisions of the Selective Training and Service Act or under the Public Resolution authorizing the President to call out the reserve units. S. 1642, introduced by Senator Reynolds, North Carolina, extends the provisions of the Longshoremen's and Harbor Workers' Compensation Act, with some modifications, to include injury or death of any employee engaged in any employment at any military, air or naval base acquired after Jan. 1, 1940 by the United States from any foreign government, irrespective of the place where the injury or death occurred. S. 1652, introduced by Senator Bone, Washington, provides for medical care, subsistence and treatment in private hospitals and medical attention by civilian physicians and surgeons for officers and enlisted men in the military and naval forces of the United

States when on an authorized furlough or leave of absence. H. R. 4943, introduced by Representative Edelstein, New York, provides workmen's compensation for employees of carriers engaged in interstate transportation by motor vehicles. The bill would devolve a duty on an employer to furnish such medical, surgical and other attendance or treatment, nurse and hospital service, medicine, crutches and apparatus for such period as the nature of the injury or the process of recovery may require. If the employer fails to supply the same, after

request by the injured employee, such injured employee may do so at the expense of the employer. H. R. 5051, introduced by Representative Jackson, Washington, and H. R. 5130, introduced by Representative Oliver, Maine, propose to extend the benefits of the United States Public Health service to any person employed on board in the care, preservation or navigation of any vessel engaged in commercial fishing, including persons employed in the service of those engaged in such care, preservation or navigation of such fishing vessels.

WOMAN'S AUXILIARY

Mrs. McReynolds Dies

Mrs. John O. McReynolds of Dallas, Texas, a past president of the Woman's Auxiliary to the American Medical Association (1927-1928), passed away on June 24. At the annual meeting of the auxiliary in Cleveland, June 2-6, the auxiliary made Mrs. McReynolds an honorary life member.

Colorado

The Denver County medical auxiliary is sponsoring the Women's Field Army of the American Society for the Control of Cancer in Denver. At the annual president's day, March 17, an educational film called "Choose to Live" was shown and Dr. W. W. Haggart talked on cancer. Other guests were the presidents of the federated clubs of Denver. A bridge benefit held February 12, called "A Salute to Health," was given to stimulate interest in the movement. Money from this will be used for an educational program in Denver. Dime banks are being given out to stimulate membership.

Nebraska

The auxiliary to the Lancaster County Medical Society met March 3 at the home of Mrs. C. H. Arnold for a white elephant sale and tea. Funds obtained from the sale are to be used for the auxiliary's continuous project—*Hygeia* in all public schools in Lincoln.

A meeting of the auxiliary to the Omaha-Douglas County Medical Society was held in Omaha on January 28. The President, Mrs. Charles P. Baker, spoke on the "Purpose and Accomplishments of the Woman's Medical Auxiliary." Mrs. C. W. Pollard of Peru spoke on legislative problems. The courtesy committee, consisting of Mesdames L. A. DeLanney, C. L. Bantin, E. M. Walsh and W. H. Schmitz, served a dutch lunch to 125 members of the medical society and others in the Medical Arts Tea Room. At a meeting February 18 the treasurer, Mrs. R. G. Lewis, reported that \$53 had been sent to pay for the gift subscriptions to *Hygeia* for every public and parochial school in Omaha. Dr. F. Lowell Dunn presented the speakers in a panel discussion of "The Weaknesses of Our Nutritional Defenses."

Virginia

The auxiliary to the Norfolk County Medical Society met January 20. Mrs. H. G. Parker, director of public welfare, spoke on "Governmental Problems in Norfolk in Connection with Defense Activities."

The auxiliary to the Northampton-Accomac Medical Society met in January at the home of Mrs. W. J. Sturgis of Nassawadox. The president, Mrs. J. L. De Cormis, presided. Dr. T. F. McGough, the health officer of Northampton County, talked on "The Need of Northampton and Accomac Counties from a Medical Standpoint." Mrs. G. W. Holland, president of the state auxiliary, gave a short history of other auxiliaries in the state. Mrs. E. W. P. Downing gave two original poems. Mrs. John P. Hamilton read "The Story of Jane Todd Crawford." This auxiliary has placed *Hygeia* in four high schools and one beauty parlor and also contributed \$45 for the purchase of two chairs for patients' rooms in the Nassawadox Hospital.

Wisconsin

The March 10 meeting of the Dane County auxiliary was held in Madison at the home of Mrs. Frank K. Dean. Mrs. Irma Williams and Miss Carolyn Schlattman, Dane County nurses, gave a résumé of work being done in the county through

the use of the Loan Closet, which is furnished by the auxiliary. The Loan Closet is stocked with beds, wheel chairs, bedding, layettes and other items. An additional \$20 was voted for this work at this meeting. Mrs. Stanley Briggs addressed the meeting on pending legislation.

The Fond du Lac auxiliary held a dinner meeting in March at the home of Mrs. L. J. Simon. Mrs. A. M. Hutter, president, announced that two parties would be given in the interest of the sponsorship of a Girl Scout troop, which is the philanthropic project of this auxiliary. A musical program was presented by 3 members, Mrs. L. J. Keenan, vocalist; Mrs. S. A. Thiesen, pianist, and Mrs. E. V. Smith Jr., violinist. Mrs. E. L. Watson of Ripon presented a paper on "The Bible in Modern Literature."

At the March meeting of the Rock County auxiliary in Beloit it was decided to form a study group. Mrs. C. P. Spaulding, instructor in the Beloit vocational school, gave a talk on the history of hooked rugs. Many rugs were on display. Mrs. H. E. Kasten, president of the auxiliary, appointed delegates to the national and state conventions; delegates to Cleveland will be Mrs. W. T. Clark, Janesville, and Mrs. O. W. Friske, Beloit, alternate.

The Waukesha County auxiliary met in March in Hartland. Mrs. J. B. Noble of Waukesha reported that photographs of all county physicians are being secured along with their histories. Mrs. W. H. Oatway Sr. spoke on medical legislation and Mrs. W. D. James on our medical defense program. The auxiliary met with Mrs. James Hassall at Rogers Memorial Sanitarium in Oconomowoc, April 2. Mrs. T. H. Nammacher of Waukesha presided. It was voted to purchase three subscriptions to the *Bulletin of the Auxiliary* and to donate \$10 to the county council of child welfare. Miss Helen St. George, an investigator for the welfare relief department and the WPA, discussed the problems associated with her position.

The Winnebago County auxiliary met in Menasha March 24 with Mrs. W. N. Linn of Oshkosh presiding. A talk on "Medical Education Today" was given by Mrs. T. D. Smith, Menasha, who took her information from Dr. Fishbein's book dealing with the changing medical work throughout the United States. Mrs. R. H. Bitter of Oshkosh spoke to the group on public relations projects.

The Dane County auxiliary has announced a public relations tea to be held May 12 at the Y. W. C. A. in Madison. Dr. Paul C. Barton of the Bureau of Investigation of the American Medical Association, Chicago, will be the speaker.

The auxiliary to the Kenosha County Medical Society met February 4 in Kenosha and voted to purchase 100 copies of the pamphlet "Health Achievements in Wisconsin" for distribution in the schools. Dr. Helen Binnic reviewed the book "Born in Paradise" by Armin von Tempski.

The luncheon of the auxiliary to the Medical Society of Milwaukee County, February 14, had an attendance of 85 members. Dr. Timothy Howard, president of the Milwaukee County Medical Society, talked on cooperation. George Crownhart, executive secretary to the state medical society, discussed the basis for sound sickness care and pending health legislation. A symposium on telephone technic for the doctor's wife was conducted by the study group. Mrs. Lillian English of the Physicians' Service Bureau stressed these points: the proper way to answer the telephone; whether or not advice should be given; how to obtain the facts for the doctor; training a maid to answer the telephone intelligently, and how the bureau assists in locating physicians.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Society News.—Dr. E. Payne Palmer, Phoenix, Ariz., discussed "Emergency Treatment of Surgical Abdominal Traumas" before the Hollywood Academy of Medicine, June 12.—Dr. Jacob Kasanin, San Francisco, discussed "A Study of the Disturbances of Intellect in Schizophrenia" before the Los Angeles Society of Neurology and Psychiatry, May 21.

Hickman Medal Awarded.—Dr. Arthur E. Guedel, Los Angeles, has been awarded the Hickman Medal of the Royal Society of Medicine, according to the *Lancet*. Mr. John G. Winant, the American ambassador, was to receive the medal for Dr. Guedel at a meeting of the society, June 5. Dr. Guedel, who specializes in anesthesia, received the award on the recommendation of the section of anesthesia of the Royal society. He graduated at the Indiana University School of Medicine, Indianapolis, in 1908.

Musgrave Memorial Chair in Tropical Medicine.—A chair to conduct special research in tropical medicine will be established in the Pacific Institute, Hooper Foundation for Medical Research, University of California, Berkeley, under provisions in the will of the late Mrs. Florence B. Musgrave, newspapers recently reported. The chair will be known as the William E. Musgrave Memorial in honor of Mrs. Musgrave's husband, who at one time served as secretary of the California Medical Association. The will stipulates that more than \$50,000 be allowed to establish the chair and further specifies that a professorship be created to conduct the study in tropical medicine.

COLORADO

Dr. Coutard Goes to Colorado Springs.—Dr. Henri Coutard, formerly of Paris and more recently of the Chicago Tumor Institute, Chicago, has been placed in charge of the new roentgen ray and radium unit of Glickner Sanatorium and Hospital, Colorado Springs. The new unit is in the Penrose Pavilion, which was opened on June 8 for the study and care of malignant diseases, and the construction of which was made possible by the late Spencer Penrose of Colorado Springs and Broadmoor. After his death the El Pomar Foundation and administrators of the hospital erected a two story annex to the hospital. According to the *Rocky Mountain Medical Journal* the ground floor contains fluoroscopic, diagnostic, physical, superficial and high voltage therapy equipment, and radium facilities adequate for radiation therapy for any type of malignant lesion; the upper floor contains operating rooms, sterilizing rooms, dressing rooms, clinical-pathologic laboratory and record rooms. Associated with Dr. Coutard are Drs. James W. McMullen, Denver, and Lloyd R. Allen, Colorado Springs. Dr. William P. McCrossin Jr. is chief of staff of the Penrose Tumor Clinic.

DELAWARE

Du Pont Institute for Crippled Children.—The Alfred I. Du Pont Institute of the Nemours Foundation was dedicated in Wilmington, June 14, with Dr. Thomas R. Brown, Baltimore, chairman of the medical advisory board, presiding. Addresses were delivered by Dr. Alfred R. Shands Jr., medical director of the institute, on "Alfred I. Du Pont Institute of the Nemours Foundation" and Francis P. Gaines, Ph.D., president, Washington and Lee University, Lexington, Va., "Alfred I. Du Pont, the Man." The institute was opened for admission of crippled children on July 1, 1940. It was financed by a bequest of \$1,000,000 in the will of Mr. Alfred I. Du Pont, who died on April 29, 1935. The trustees first incorporated the Nemours Foundation under the laws of Florida, Sept. 2, 1936, and ground was broken June 20, 1939. The institute has eighty-five beds, seventy-two of which are occupied at the present time. The research laboratory division is operated with Dr. Lee E. Farr as the director of research, Dr. Douglas A. MacFadyen as biochemist and Dr. Daniel Murray Angevine as the pathologist and bacteriologist. The research department has a fifteen bed research ward. The laboratories were opened on July 1.

DISTRICT OF COLUMBIA

President's Night.—The Order of Merit of the Medical Society of the District of Columbia was recently presented to Dr. Edward Y. Davidson at a special meeting of the society designated "President's Night." The certificate will be awarded annually in the future to the physician deemed to have made the most worthwhile contribution to the society. Dr. Davidson was president of the society in 1916 and sponsored erection of the present headquarters. Honorary membership was conferred on Charles S. Baker, attorney for the society. Dr. Daniel L. Borden, president, gave an address entitled "Stand By." A program of American music was rendered by members of the society and their families and the doctors' string quartet.

GEORGIA

State Medical Election — Crawford Long Prize Awarded.—Dr. James A. Redfearn, Albany, was chosen president-elect of the Medical Association of Georgia at its recent annual meeting in Macon and Dr. Allen H. Bunce, Atlanta, was installed as president. Other officers include Drs. Hudnall G. Weaver, Macon, and Bannester Lester Harbin, Rome, vice presidents; Dr. Edgar D. Shanks, Atlanta, was reelected secretary. The 1942 session will be in Augusta, April 28-May 1. Dr. Robert B. Greenblatt, professor of experimental medicine, University of Georgia School of Medicine, Augusta, received the Crawford W. Long Memorial Award for his paper showing outstanding research on female glandular ailments. A fund of \$10,000 was announced at the meeting, raised by members of the association, to carry on a campaign for health education in rural districts and to provide care for needy physicians and their families.

ILLINOIS

Psittacosis in Oak Park.—One case of psittacosis was recently reported in Oak Park. The patient recovered. According to *Public Health Reports*, the infection was apparently contracted from love birds. Three birds purchased by the patient in Chicago died within a period of two or three months, the last one on April 5.

State Medical Election.—Dr. Edward H. Weld, Rockford, was named president-elect of the Illinois State Medical Society at its recent meeting in Chicago and Dr. Charles H. Phifer, Chicago, was inducted into the presidency. Springfield was chosen for the 1942 meeting. Drs. Hubbard P. Saunders and Fred H. Muller, Chicago, were chosen vice presidents. Dr. Harold D. Camp, Monmouth, is the new editor of the society's journal. He will continue as secretary-treasurer. Dr. Clayton J. Lundy, Chicago, a member of the staffs of La Rabida Jackson Park Sanitarium and Rush Medical College, Chicago, received the society's first medal for the best scientific research exhibit.

State Hospital Quarantined for Typhoid.—The East Moline State Hospital, East Moline, has been quarantined for typhoid after the development of 5 cases in the last two weeks, newspapers reported, June 25. It is believed that the disease was introduced into the hospital by a carrier admitted recently as a patient, it was stated. The hospital has about 1,300 patients, but all the typhoid cases were in one ward of 70 men. Newspapers also announced on June 25 that a new water supply was to be started at the Manteno State Hospital for the Insane early in July. A typhoid outbreak occurred at Manteno in 1939 which was responsible for many deaths and more than 400 cases of the disease.

Chicago

Branch Meetings.—The South Chicago Branch of the Chicago Medical Society was addressed, May 27, by Drs. Hollis E. Potter on "Roentgenology of the Chest" and Carl Werelius, "Explanation of Early Deaths in Bowel Obstruction."—Dr. Sidney O. Levinson discussed "Plasma and Serum Transfusion as a Blood Substitute" before the Irving Park Branch, May 27.

Child Research Grant Available.—Applications for the Elizabeth McCormick Child Research Grant of the Institute of Medicine of Chicago, consisting of \$1,500, will be received up to October 15, the award to be made soon after this date. Projects should in a broad sense be in the field of pediatrics. All applications should be addressed to Dr. John Favill, secretary of the Elizabeth McCormick Child Research Grant, 122 South Michigan Avenue.

Hamilton Anderson Visits United States.—Dr. Hamilton H. Anderson, professor and head of the department of pharmacology, Peiping Union Medical College, Peking, China, is on a five months leave of absence. He expects to sail from

San Francisco August 1 to return to China. Dr. Anderson was a member of the staff of the Council on Medical Education and Hospitals, in charge of postgraduate education, prior to his appointment in China.

Dr. Fabricant Wins Casselberry Award.—Dr. Noah D. Fabricant, associate in the department of otology, laryngology and rhinology, University of Illinois College of Medicine, was presented with the Casselberry Medal and prize of \$100 at the annual meeting of the American Laryngological Association in Atlantic City, May 29. Dr. Fabricant received the award for his research on the common cold and specifically for his studies which determined the acidity of the mucous membranes of the nose. He graduated at the University of Illinois College of Medicine in 1928 and is 36 years of age.

IOWA

Outbreaks of Gastroenteritis.—Twenty-two persons were reported ill in an outbreak of gastroenteritis in Grinnell recently following a luncheon. In all but 3 instances, symptoms subsided the following day. Staphylococcus toxin was found to be the cause of the outbreak. Evidence of the bacteria was found in the egg salad, ham and creamed peas which were served at the luncheon. This cause was also held responsible for a small outbreak in Cedar Rapids recently, involving 4 young men who were sick after eating ham and mayonnaise sandwiches.

Portrait of Dr. Steindler.—Special exercises were held at the State University of Iowa College of Medicine, Iowa City, May 27, to mark the presentation to the university of the portrait of Dr. Arthur Steindler, professor and head of the department of orthopedic surgery. The portrait, a gift of former students and present staff members, is the work of Sidney Dickinson of New York. Dr. Steindler has been teaching at the university since 1913. Orthopedic surgeons came from all parts of the United States to honor their former teacher. The morning was spent in case demonstrations by staff members, and in the afternoon papers were presented by the staff and visiting alumni. In the evening a banquet was held, attended by two hundred and sixty-five colleagues and friends. The portrait was accepted by President Virgil M. Hancer for the university. At the noon luncheon a permanent Steindler Alumni Club was formed, which plans to meet annually in connection with the sessions of the American Academy of Orthopaedic Surgeons.

MICHIGAN

Personal.—Dr. Ira G. Downer, for five years secretary-treasurer of the Detroit Academy of Surgery, was recently elected president of the group.—Dr. Frank N. Wilson, Ann Arbor, was recently elected an honorary member of the Cardiac Society of Great Britain and Ireland.

Outbreak of Smallpox.—Twenty-two cases of smallpox in mild form were reported the first week in May in Port Huron. While an outbreak of 9 cases was reported in Richmond, just north of Mount Clemens in Macomb County, in January, the Port Huron outbreak is the first in which a significant number of cases has been found in any single area this year, the state department of health reported. Seventy-four cases of the disease had been reported this year up to May 28, 2 less than the total recorded for the entire year of 1940.

New Laboratory to Study Virus Diseases.—A laboratory will be established at the University of Michigan, Ann Arbor, under a grant of \$30,000 from the National Foundation for Infantile Paralysis. The laboratory will temporarily be operated in the University Hospital but on completion of the new School of Hygiene and Public Health will be transferred there. Infantile paralysis and other virus diseases will be studied in the new laboratory, and field studies in nearby communities will be made to promote the work.

Clinic of Human Heredity.—The University of Michigan, Ann Arbor, has established a department of heredity as a division of the laboratory of vertebrate genetics to work in close cooperation with the medical school. A heredity clinic, to be conducted by the new department, has also been established with quarters in the University Hospital. It will secure the data necessary to determine the role played by heredity in the production of or predisposition to malformations and disease. The new department and clinic are the outgrowth of studies of heredity in animals which have been conducted in

the laboratory of vertebrate genetics for many years and which were expanded this year to include certain problems of human heredity by a grant from the Rackham Research Fund.

Upper Peninsula Medical Meeting.—The Upper Peninsula Medical Association will meet at the Grand View Hospital in Ironwood, July 17-18, under the presidency of Dr. William E. Tew, Bessemer. The following will speak:

Dr. Herman O. McPheeters, Minneapolis, Treatment of Varicose Veins.
Dr. Clayton G. Weigand, Indianapolis, Practical Application of Vitamin Therapy.

Dr. James C. Sargent, Milwaukee, Excretory Urography in the Study of Urologic Disease.

Dr. Francis D. Murphy, Milwaukee, Clinical Application of the Sulfonamide Group of Drugs.

Dr. Leo G. Rigler, Minneapolis, X-Ray in Acute Conditions of the Abdomen.

Dr. Charles W. Mayo, Rochester, Minn. (subject not announced).

Dr. Ralph P. Sproule, Milwaukee, Eye Injuries.

Dr. Louis A. Buie, Rochester, Minn., Rectal Diseases.

Dr. Paul B. Magnuson, Chicago, Industrial Backache.

Dr. Solomon C. Freed, Chicago, Practical Application of Hormone Therapy.

MISSOURI

Professor of Anatomy Retires.—Dr. Robert J. Terry, professor of anatomy, Washington University School of Medicine, St. Louis, has announced his retirement. He will be succeeded by Edmund V. Cowdry, Ph.D., professor of cytology. Dr. Terry was born in St. Louis in 1871, graduating at the Missouri Medical College in 1895. This school was absorbed by the Washington University School of Medicine in 1899. Dr. Terry was dean of the Officers School of Oral and Plastic Surgery, U. S. Army, 1917-1918, and has served as president of the St. Louis Academy of Sciences and of the American Association of Physical Anthropologists. Dr. Cowdry received his degree at the University of Chicago in 1913, where he had taught anatomy for four years. He was associate in anatomy at Johns Hopkins University School of Medicine, Baltimore, from 1913 to 1917, when he went to Peiping Union Medical College. From 1921 to 1928 he was an associate member of the Rockefeller Institute for Medical Research. He has been professor of cytology at Washington University since 1928. He was chairman of the division of medical sciences of the National Research Council, 1930-1931.

NEW HAMPSHIRE

State Medical Election.—Dr. Charles H. Dolloff, Concord, was elected president of the New Hampshire Medical Society at the annual meeting at Manchester, May 13-14. Dr. Henry C. Sanders Jr., Claremont, was elected vice president and Dr. Carleton R. Metcalf, Concord, reelected secretary.

NEW JERSEY

State Medical Meeting and Election.—Dr. Elias J. Marsh, Paterson, was chosen president-elect and Dr. Thomas K. Lewis, Camden, was installed as president of the Medical Society of New Jersey at the one hundred and seventy-fifth anniversary meeting, which was held at Haddon Hall in Atlantic City, May 20-22. Drs. Ralph K. Hollinshed, Westville, and Joseph F. Londrigan, Hoboken, were elected vice presidents and Dr. Alfred Stahl, Newark, was reelected secretary. The program included a "General Anniversary Session" with speakers representing state agencies engaged in activities related to health; a symposium on peripheral vascular disease with Dr. Irving S. Wright, New York, as guest speaker, and a symposium on acute diseases of the abdomen, with Dr. George P. Müller, Philadelphia, as the guest. Dr. Israel J. Wolf, Paterson, received the society's prize essay award with a paper on the treatment of rickets with massive doses of vitamin D.

NEW YORK

Syracuse Alumni Meeting.—The annual alumni reunion of Syracuse University College of Medicine was held, May 29, with the following speakers on the day program:

Col. William C. Munly, U. S. Army, Washington, D. C., Medical Department Activities in the Training Program.

Dr. Edward M. Keni, Glenn Dale, Md., Recent Advances in Thoracic Surgery.

Dr. James Howard Means, Boston, Miscellaneous Topics on Thyroid.

Dr. Grover F. Powers, New Haven, Conn., Streptococcosis in Children.

Speakers at a banquet in the evening were Chancellor William P. Graham of the university, Dr. Herman G. Weiskotten, dean and professor of pathology at the medical school, and Dr. Thomas F. Manley, Norwich.

New York City

Society News.—Dr. James Ewing addressed the Society of Medical Jurisprudence, May 12, on "Problems in Traumatic Cancer."—Drs. William Bierman and Sidney H. Licht addressed the New York Physical Therapy Society, May 14, on "History of Fever Therapy" and "History of Electrodiagnosis" respectively.—Ross A. McFarland, Ph.D., and Dr. Ashton Graybiel, Boston, addressed a combined meeting of the New York Heart Association and the section of medicine of the New York Academy of Medicine, May 20, on "Neurocirculatory Adjustments During Flying," discussing physiologic and clinical aspects, respectively.—John R. Dunning, Ph.D., and Dr. John M. Kenney addressed the New York Roentgen Society, May 19, on "The Cyclotron and Its Possible Applications to Therapy" and "Use of Artificially Radioactive Substances in Cancer Therapy" respectively.—Dr. Ira S. Wile addressed the Bronx County Medical Society, June 18, on "The Problem Child: Medical, Psychological and Social Aspects."—Dr. Hugh Chaplin addressed the Medical Society of the County of Queens, May 27, on "Treatment of the Premature Infant."

OHIO

Cleveland Academy Awards Medal.—The Academy of Medicine of Cleveland presented its first distinguished service medal at its annual meeting, May 16, to Dr. John J. Thomas, who has practiced in Cleveland since 1895. Dr. Thomas graduated from Western Reserve University School of Medicine in 1893, afterward spending a period of study in Europe. He has served as associate clinical professor of obstetrics at Western Reserve and has been active in civic affairs.

Dr. Kemp to Succeed Dr. Upham.—Dr. Hardy A. Kemp, dean and professor of bacteriology and preventive medicine, University of Vermont College of Medicine, Burlington, has been appointed dean of Ohio State University College of Medicine, Columbus, to succeed Dr. John H. J. Upham, who is retiring. Dr. Kemp went to Vermont in 1939 from Baylor University College of Medicine, Dallas, Texas, where he was professor of bacteriology and preventive medicine. He graduated from St. Louis University School of Medicine in 1926 and went to Baylor in 1928 as associate professor of bacteriology and hygiene. He is 38 years old.

PENNSYLVANIA

Society News.—Charles D. Grosscup, Ph.D., and Dr. John Eiman, Abington, addressed the Dauphin County Medical Society, Harrisburg, June 3, on "Water and Solute Balance in Health and Disease," discussing theoretical considerations and clinical application in surgical and medical cases, respectively.—Dr. Bernard I. Comroe, Philadelphia, addressed the Harrisburg Academy of Medicine, June 17, on arthritis.—Dr. Jesse L. McCracken, Smithfield, addressed the Fayette County Medical Society, Uniontown, June 12, on "Arthritis from the Standpoint of the General Practitioner."

Philadelphia

Personal.—Dr. Esmond R. Long, Philadelphia, professor of pathology at the University of Pennsylvania School of Medicine and director of the Henry Phipps Institute, has been elected an honorary member of the Athenaeum of the History of Medicine of Buenos Aires.—Dr. Ella Roberts has been appointed medical director of the Children's Heart Hospital, succeeding Dr. Oswald F. Hedley, U. S. Public Health Service, who served as acting director while making a survey of rheumatic fever in Philadelphia.

Society News.—Speakers at a meeting of the Philadelphia County Medical Society, May 1, were Drs. Charles H. Harney, on "Multiple Primary Malignant Disease"; Hubley R. Owen and Lewis C. Manges Jr., "Fractures of the Lower Third of the Tibia and Fibula," and Edward F. McLaughlin, "Ovarian Lesions Simulating Appendicitis."—Henry F. Vaughan, Dr.P.H., Detroit, delivered the seventeenth James M. Anders Lecture of the College of Physicians of Philadelphia, May 7, on "The Way of Public Health."—At a meeting of the Philadelphia Urological Society, May 12, the speakers were Drs. William J. Ezickson and Lester M. Morrison on "Role of the Liver and Thyroid as Metabolic Factors in the Production of Renal Calculi"; James F. McCahay, "Testis Hormone Deficiency: Diagnosis and Treatment with Testosterone Propionate," and Leroy W. LaTowsky, "Use of Sulfadiazine in the Treatment of Gonorrhea in the Male—A Study of Sixty Cases."

TEXAS

State Medical Election.—Dr. Judson L. Taylor, Houston, was chosen president-elect of the State Medical Association of Texas at the annual meeting in Fort Worth in May, and Dr. Neil D. Buie, Marlin, became president. Vice presidents elected were Drs. Caleb O. Terrell, Fort Worth; Mitchell O. Gibson, Lufkin, and Robert B. Touchstone, Lytle. The 1942 session will be held in Corpus Christi.

VIRGINIA

Personal.—Dr. Claude C. Coleman, Richmond, has been appointed to the board of visitors of the College of William and Mary, Williamsburg, of which he is an alumnus. He succeeds Mr. Edward R. Stettinius Jr., chairman of the priorities board of the Office of Production Management, Washington, D. C.—Dr. Willard L. Quennell has resigned as medical director of the Norfolk General Hospital and Mr. Willard P. Earnsey Jr., superintendent of the Cherokee County Hospital, Gaffney, S. C., was appointed to succeed him.

Changes in Health Officers.—Dr. James M. Suter, Bristol, health officer of Bristol and Washington County, has resigned to enter military service. Dr. John G. McNiel, Bristol, formerly health officer of Montgomery County, will succeed Dr. Suter. Dr. Charles L. Savage, Ashland, has resigned in Hanover County to enter the field of industrial medicine and Dr. John D. Hamner Jr., Courtland, formerly in Southampton County, succeeded him. Dr. Hubert D. Crow, Lawrenceville, has been transferred to Southampton County. Dr. William P. Terry, Charlotte C. H., health officer of Charlotte County, has been called to military service, and Dr. Paul W. Bowden, Baltimore, who has just completed a course in public health at Johns Hopkins University, Baltimore, has been appointed to succeed him.

WASHINGTON

Annual Postgraduate Course.—The twenty-fifth anniversary course of lectures and clinics will be presented by the University of Washington, July 14-18, at the university and at King County Hospital, Seattle. The lecturers will be:

Dr. Howard C. Naffziger, professor of surgery, University of California Medical School, San Francisco.

Dr. Maurice Charles Pincoffs, professor of medicine, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore.

Dr. Max Thorek, Chicago, who will lecture on surgical subjects.

Dr. John H. Stokes, professor of cutaneous medicine and syphilology, University of Pennsylvania School of Medicine, Philadelphia.

Dr. John B. D. Saunders, professor of anatomy and lecturer in medical history and bibliography, University of California Medical School, San Francisco.

PHILIPPINE ISLANDS

Medical Election.—Dr. Victorino de Dios, Manila, was elected president of the Philippine Medical Association at the annual meeting in April. Drs. Januario R. Estrada and Honoria Acosta-Sison, Manila, were elected vice presidents and Dr. Conrado D. Ayuyao, Manila, was elected secretary-treasurer for five years.

PUERTO RICO

Institute on Venereal Disease.—An institute for public health workers in the field of venereal disease was held, May 12-16, in Mayaguez under the auspices of the Mayaguez health unit. Dr. Domingo Nochera, health officer of Mayaguez, was in charge of the program, which consisted of round table discussions, field work, demonstrations of laboratory procedures and clinical demonstrations. One feature was a discussion of "Venereal Disease and the National Defense" led by Dr. Thomas H. D. Griffiths, U. S. Public Health Service, adviser to the Puerto Rico Department of Public Health. Participants announced included Dr. Eduardo Garrido Morales, health commissioner of the island; Col. William Denton or his representative from the U. S. Army Medical Corps, Puerto Rican Department; Comdr. James G. Dickson or his representative, Medical Corps, Tenth Naval District; Dr. Oscar G. Costa Mandry, San Juan, chief of the biologic laboratory of the insular department of health, and Dr. Jose Chavcs, chief, bureau of public health units. Among other speakers were Drs. James A. Doull, Cleveland, visiting professor at the School of Tropical Medicine, University of Puerto Rico, under the auspices of Columbia University; Myron E. Wegman, assistant professor of child hygiene at the school and assistant director of the division of education and research in the Puerto Rico health department, and Ernesto Quintero, chief of the bureau of venereal diseases in the health department.

GENERAL

Board of Orthopaedic Surgery.—The American Board of Orthopaedic Surgery announces that its next examination will be in Washington, D. C., in January 1942. Officers of the board are Drs. Fremont A. Chandler, Chicago, president; John C. Wilson, Los Angeles, vice president, and Guy A. Caldwell, 3439 Prytania Street, New Orleans, secretary-treasurer.

New Searle Laboratories.—G. D. Searle & Co., Chicago, manufacturers of pharmaceuticals, announce that construction has started on their new building on the outskirts of Chicago in the Skokie district. The building will include the manufacturing plant, scientific laboratories and offices. It is a streamlined structure of 1,500,000 cubic feet content, having about three times the present space. It is of reinforced concrete, flat-slab construction and comprises three floors and a basement. The latter will be devoted almost wholly to social activities and includes a completely equipped auditorium for use by the employees and for meetings and lectures by local or visiting medical groups. Air conditioning will be installed throughout the building with provision for special conditions of temperature or humidity required for certain operations. Passageways are in general to be glass walled so that visitors or others may observe the processes without opening doors or entering production units, thus minimizing dangers of contamination. In other areas, notably the entire ampule department, where the utmost sterility is required, electrostatic air filters of newest design are to be employed, coupled with sterilizing ultraviolet lamps.

Home Study Courses in Ophthalmology and Otolaryngology.—The American Academy of Ophthalmology and Otolaryngology recently announced that its home study courses in the fundamentals of the two specialties, which were instituted in August 1940, will be given again this year. These courses are primarily intended for residents in specialized institutions that give no formalized instruction in fundamentals. The registration of four hundred and sixty-five for the first year, however, included many physicians who were preparing for examinations by the special boards and many who were practicing in small communities without facilities for post-graduate instruction, the committee reported. Each registrant receives on the first of each month a reading list. At the end of the month he receives twenty questions covering the material. These are answered and returned to the committee. The papers are corrected and graded by different groups of men. Each month one man is put in charge, and he divides the work among his group of assistants, all of whom have certificates from the examining boards. Corrected papers are then returned to each registrant for inclusion in a file that is supplied to him. The cost of a course is \$10. The new courses will start on August 1. Registration should be in the hands of Dr. William P. Wherry, 1500 Medical Arts Building, Omaha, by July 15 at the latest. Dr. Harry S. Gradle, Chicago, is in charge of the course in ophthalmology and Dr. Frank J. Novak Jr., Chicago, of that in otolaryngology.

Meeting of U. S. P. Board of Trustees.—The annual meeting of the board of trustees of the United States Pharmacopoeial Convention was held in New York on May 24-25. The board received a committee of the council of the American Pharmaceutical Association to discuss questions of mutual importance concerning the U. S. Pharmacopeia and the National Formulary, and arrangements were made for further discussions early in 1942 of the principles of revision of the two works. Plans were made for reconvening the 1940 convention to consider the report of a committee appointed to revise the constitution and by-laws. Dr. Allen H. Bunce, Atlanta, Ga., chairman of this special committee, and Charles H. Rogers, Sc.D., Minneapolis, chairman of a subcommittee in charge of preparing a draft of the new constitution and by-laws, met with the trustees in New York for discussion of the redrafting. The object of the changes, as indicated by the 1940 convention, is to reduce the number of delegates, to insure a representative delegation and to simplify the general methods of procedure for the convention proper. The board also considered questions involving the U. S. Pharmacopeia XII, which is expected to appear later this year. Any texts not completed in time will be published in a supplement, it was decided. Descriptions of patented articles of sufficient therapeutic importance to be included in the U. S. Pharmacopeia will be prepared and in the absence of specific objections by the patent holders they will be included. In the case of specific objections, such products will be omitted. Members of the board are Evander F. Kelly, Pharm.D., Washington, D. C., chairman; Drs. Walter A. Bastedo and Cary Eggleston, New York, and Morris Fishbein, Editor of THE JOURNAL, Chicago; Ernest

Fullerton Cook, Pharm.M., Philadelphia; Ernest Little, Ph.D., Newark, N. J.; Robert L. Swain, Pharm.D., New York, and Adley B. Nichols, Ph.D., Philadelphia, secretary. The officers of the board were reelected for the current year.

Special Society Elections.—Dr. Russell S. Boles, Philadelphia, was elected president of the American Gastro-Enterological Association at its recent annual meeting; other officers include Drs. Sara M. Jordan, Boston, and Abraham H. Aaron, Buffalo, vice presidents; John G. Mateer, Detroit, treasurer, and Jacob Arnold Barger, Rochester, Minn., secretary.—Dr. Bruce H. Douglas, Detroit, was elected president of the National Tuberculosis Association at the annual meeting in San Antonio, Texas, in May, and Dr. James Burns Amberson Jr., New York, was named president-elect. This is the first time the association has had a president-elect. Vice presidents elected were Drs. Frederick H. C. Heise, Trudeau, N. Y., and Henry F. Carman, Dallas, Texas. Dr. Charles J. Hatfield, Philadelphia, was reelected secretary. The American Trudeau Society, the medical section of the association, elected Drs. Harold G. Trimble, Oakland, Calif., as president; William Atmar Smith, Charleston, S. C., vice president, and Julius L. Wilson, New Orleans, secretary. The 1942 meeting will be in Philadelphia.—Dr. Hiram Houston Merritt, Boston, was elected president of the American branch of the International League Against Epilepsy at its annual meeting in Richmond, Va., May 5. Vice presidents elected were Drs. David C. Wilson, Charlottesville, Va., and Milton Rosenbaum, Cincinnati, and Frederic A. Gibbs, Boston, was made secretary. Dr. Adolf Meyer, Baltimore, was elected vice president for America for the international organization.—Officers elected at the meeting of the American Institute of Nutrition recently in Chicago were Albert G. Hogan, Ph.D., Columbia, Mo., president; Leonard A. Maynard, Ph.D., Ithaca, N. Y., vice president, and Arthur H. Smith, Ph.D., Detroit, secretary.—Dr. Harvey B. Stone, Baltimore, was elected president of the American Surgical Association during its recent annual meeting in White Sulphur Springs, W. Va. Other officers include Drs. Loyal Davis, Chicago, and Daniel C. Elkin, Atlanta, Ga., vice presidents; Charles G. Mixter, Boston, treasurer, and Fordyce B. St. John, New York, secretary.—Dr. Clarence O. Sappington, Chicago, was chosen president-elect of the Central States Society of Industrial Medicine and Surgery at its annual meeting in Davenport in May, and Dr. Urban E. Gebhard, Milwaukee, was installed as president. Dr. Emery B. Neff, Moline, Ill., was named vice president and Dr. Frank P. Hammond, Chicago, was reelected secretary-treasurer.

Government Services

The Government Seeks Nurses

The U. S. Civil Service Commission has issued a notice pointing out that requirements for the position of junior graduate nurse, for which examinations were recently announced, have been modified. Written examination will not be required, and the visual requirements have been changed. Vision without glasses must be at least 20/100 (Snellen) in each eye and must be corrected to at least 20/20 in one eye and 20/30 in the other eye. Ordinary conversation must be heard at a distance of at least 15 feet, one ear. The salary for this position is \$1,620. Appointments will be in the U. S. Public Health Service, Federal Security Agency, Veterans' Administration and the Indian Field Service, Department of the Interior.

Positions are also available for associate public health nursing consultants at \$3,200 a year and assistant public health nursing consultants at \$2,600. Competitors will not be required to report for examination at any place but will be rated on the extent of their education, on the extent and quality of their experience and on their fitness.

Because of the demand for eligible persons for the junior graduate nurse positions, applications will be accepted continuously until further notice. Applications for the public health nursing consultant positions must be on file with the U. S. Civil Service Commission at Washington, D. C., not later than July 26.

The necessary application forms may be obtained from any first or second class post office, except in the following cities, where the forms must be obtained from the district headquarters of the civil service commission: Atlanta, Boston, Chicago, Cincinnati, Denver, New Orleans, New York, Philadelphia, Seattle, St. Louis, St. Paul, San Francisco, Honolulu, Balboa Heights, Canal Zone, and San Juan, Puerto Rico.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 24, 1941.

Transfusion of Blood Derivatives

At the Royal Society of Medicine Col. Lionel Whitby opened a discussion on the transfusion of blood derivatives. Transfusion should always be performed with a definite object—restoration of oxygen carrying capacity, for which red cells are essential, or restoration of blood volume, for which any innocuous fluid, well retained in the circulation, is suitable. Transfusion is rarely used to contribute leukocytes, platelets, clotting elements, complement or antibodies. Blood derivatives as a rule are efficient for restoring blood volume, but, with the exception of stored blood, are useless for restoring oxygen carrying capacity. Including stored blood, they are useless for contributing leukocytes or serologic constituents. Blood under a week old, properly taken and stored, is almost as good as fresh blood for restoring oxygen carrying capacity. The disadvantage of stored blood is the complexity of the apparatus required. The effect of saline or dextrose infusion is transient. The best replacement substance, and the one adopted in the army, is plasma-saline. Acacia-saline is efficient for maintaining blood pressure, but it is difficult to make two suspensions alike. The order of preference is whole blood, plasma, hemoglobin-Ringer solution, acacia-saline, isotonic saline and isotonic dextrose. The index of efficiency of plasma is its protein content, because crystalloids are rapidly excreted. The plasma produced by the army transfusion service has a protein content of 4 to 5 per cent. Its utility for blood loss was unequivocal.

In the treatment of more than 100 air raid casualties 165 pints of plasma, up to 56 days old, was used. The maximum given in any one case was 6 pints (3 liters). Its utility for blood loss proved unequivocal. Its use must be controlled by serial blood pressure examinations. The rise of blood pressure to be expected from each pint transfused is between 10 and 20 mm. of mercury. The commonest cause of failure of the blood pressure to rise with transfusion is continued bleeding. The need for transfusion rarely ends in the resuscitation ward. The patient should be sent to the operating room with the cannula tied in a bottle of slowly dripping blood, which can be at once accelerated, if necessary.

Dr. Janet Vaughan described the work of the Northwest London blood supply depot. Concentrated red cells were useful when it was necessary to raise the protein content without affecting the blood volume. Unfiltered, filtered and dried plasma and filtered, dried and citrated serum are available, but only the first two groups of plasma and serum respectively were used in the depot. Unfiltered plasma was obtained by siphoning from sedimented red cells, preferably after five days and not later than two weeks. It rarely formed clots. No serious reactions followed the use of any of the preparations. Plasma, serum and blood seemed equally effective. If severe sepsis is present, fresh blood should be given. The only sure guide to therapeutic value was rise in blood pressure; the pulse was unsatisfactory in most shocked patients. Transfusion is too often delayed for twenty-four hours or until after "cleaning up." It should start before arrival at the operating room and continue all through surgical intervention and into the ward—for twenty-four to forty-eight hours. If protein fluid continues to drain from the patient, transfusion must go on still longer, fresh blood being used for choice. After burns, plasma and serum are better than blood during the first twenty-four hours, when

hemoconcentration occurs. Concentrated serum will reduce local edema but is disappointing in nephrotic edema. Dried serum has the advantages that it does not clot, is not readily infected and is small in bulk. Plasma seems to be an ideal culture medium; the infection rate is 7 per cent. Concentrated red cells are valuable in aplastic anemia, anemia associated with sepsis and anemia in the elderly who require immediate operation.

American Gift to the Royal Society

The American Philosophical Society expressed a desire to make a gift of \$10,000 to the Royal Society, its British counterpart, and sent an inquiry through our consul general in Philadelphia asking whether the society would have any objection to receive it or to the publicity which would result. The president, Sir Henry Dale, whose recent election has been reported (*THE JOURNAL*, February 8, p. 529) and who is the eighth of the forty-four presidents who were members of the medical profession, replied that the society would be glad to accept the gift and use it in accordance with the society's charter "for the promotion of natural knowledge." The society would further desire it to receive wide publicity, as additional evidence of the spirit of friendship and the common purpose which animate the men of science in the two countries. The American Philosophical Society was founded in 1743 by Benjamin Franklin, who was elected to the fellowship of the Royal Society in 1756.

In a letter to the *Times* stating these facts, Sir Henry Dale says that the United States is now organizing its tremendous scientific and technical resources alongside those of Britain for the immediate duty of defending the mental and spiritual freedom in which alone science can flourish. It is a token of the desire of the men of science in America to help their colleagues in this country to keep alive the tradition of the pursuit of knowledge for the benefit of all mankind, even when so much has to be given to immediate purposes of war.

The Museum of the Royal College of Surgeons Wrecked

The greatest pathologic and anatomic museum in the world has been wrecked by German bombs and irreparable damage has been done. Fortunately the famous Hunterian collection, purchased by the government for \$75,000 after John Hunter's death in 1793, is probably safe under the debris, as it had been removed as a precaution into reinforced sections of the sub-basement. Also the collection of portraits and pictures, including Reynold's portrait of Hunter and many of the more valuable books of the library, are safe in the country. The part of the records still at the college are stored in strong rooms that have withstood the blast and flames. But thousands of museum pieces are gone, including skeletons of kangaroos brought by Captain Cook from Australia and the comparative osteology collection of 4,000 specimens, acknowledged to be the finest in the world. Much of the material antedated British Museum specimens, and the greater part of the wonderful work of Sir Richard Owen and William Flower is lost. All John Hunter's furniture, which was in the president's room, is destroyed. The original surgical instruments used by Lister have been recovered, but many others are lost. The oldest Egyptian mummy in the world, that of Ras Nefer, who is said to have died about 2900 B. C., was destroyed, but many mummies of popular interest have been saved. The invaluable army medical war collection, formed after the last great war, containing plaster casts of every type of wound, was also destroyed.

Incendiary bombs first fell on the roof of the college, and just as a watcher was giving the alarm a high explosive struck room 5 of the museum. Only two of the persons in the building were slightly injured. In spite of great damage to the interior, the fabric of the college is more or less intact, but the museum buildings have suffered severely.

Nurses Demand More Money

The recent announcement by the Ministry of Health regarding student nurses and members of the Civil Nursing Reserve has given rise to many complaints, and the Council of the Royal College of Nursing, the most representative body of nurses in the country, which has a membership of more than thirty thousand fully trained nurses and eight thousand student nurses, has drawn up a scale of salaries and conditions. They want standard conditions in hospitals and institutions and a scale of salaries and allowances to operate in conjunction with a scheme of superannuation. Staff nurses after the termination of their training school agreement should have \$500 per annum, increasing by increments of \$25 annually to \$750; ward sisters \$750, rising by increments annually of \$50 to \$1,000; a resident qualified senior sister of a large training school \$1,500, rising by increments of \$125 to \$2,500. The salary of a matron of a hospital of above five hundred beds should be from \$3,000 to \$5,000; of the assistant matron from \$1,500 to \$2,500. Because of the special training involved in teaching, holidays should more nearly approach those of the teaching profession. There should be a free period daily, free week ends and at least six weeks' annual leave.

The Admiralty has announced increased rates of pay. The new annual rates are: nursing sisters \$475, reserve nursing sisters \$525. Higher rates will be allowed for sisters who have approved nursing experience of three years or more, as follows: three years \$550, six years \$575, nine years \$600.

Preparations for a Gas Attack

It is known that the Germans have large quantities of poison gas available and therefore a gas attack on this country on a large scale is regarded as a definite possibility. As part of air raid precautions, anti-gas measures are receiving attention. It is recognized that the first experience of gas might cause alarm. It has been said that a people who can stand the terrors of aerial warfare as at present known to them will not be broken by gas as long as they are prepared. Surprise would be its chief advantage. A new gas is of course not impossible, but experts believe that any development in gas technic is more likely to be in new methods of releasing the poison. The official advice is to be suspicious of any unaccountable smell or effect on the eyes, nose or lungs and to put on the respirator immediately. Any attempt by civilians to distinguish the particular gas is discouraged as likely to involve unnecessary exposure.

At the air raid precautions school there are almost unlimited opportunities to demonstrate the effect of chemical warfare. Dissemination of gases is studied at close quarters, and methods of detection are demonstrated. The decontamination service comprises squads of 5 men . . . [censored]. Reserves must be available. Local authorities are arranging for the interchange of first aid and gas decontamination services. These authorities have prepared as far as possible for the rapid recovery of all public services after a gas attack. But individuals must look after their own safety as they have been instructed in anti-gas measures by government leaflets.

Bombing a Hospital Ship

As previous letters to THE JOURNAL show, the bombing of hospitals and hospital ships is a German routine. The latest example is the following: An S O S was received in the Mediterranean from the hospital ship *Aba*, formerly an Elder Dempster steamer, saying "I am being attacked by enemy planes." Steaming to the scene, British war ships met the hospital ship after three and one-half hours and found that it had escaped damage in spite of eight near misses. Within forty minutes of the warship's arrival eight Junkers 87 returned to the attack, dive bombing both the hospital ship and one of the

warships. The attack was difficult to break up because the dazzling light made it hard to fix the target. Although the warship received no direct hit, there were many near misses of it as well as of the hospital ship.

Prof. Lovell Gulland

The death at the age of 79 years of Prof. Lovell Gulland has removed a noted clinician and teacher. Born at Edinburgh and educated at its university, he graduated after a distinguished career as a student with a thesis on the development of lymphocytes which has become a classic. He became physician to the Royal Infirmary, the Chalmers Memorial Hospital and the Royal Victoria Hospital for Tuberculosis. In 1915 he was appointed professor of medicine in Edinburgh University. His particular interest was diseases of the blood, on which he wrote many papers and, in collaboration with Alexander Goodall, a monograph, "The Blood and Its Diseases," and, in collaboration with Prof. Stanley Davidson, "Pernicious Anemia." He was a pioneer in hematology, on which he was known as an authority all over the world.

Increase of the Population of India

While war conditions have prevented census operations in Britain, the decennial enumeration of the population of India took place according to plan. The preliminary figures indicate that 400,000,000 people were enumerated. The increase for the ten years was as high as 18 per cent against 10 per cent in the previous decennium, 1921-1931. On this occasion there was the fullest public cooperation, whereas in 1931 Mr. Gandhi's civil disobedience campaign was in progress. The large rate of growth, foreseen by the public health commissioner, is attributable mainly to the decade having been on the whole healthful and prosperous with satisfactory monsoons, and to the effect of ameliorative measures and irrigational extensions.

SWITZERLAND

(From Our Regular Correspondent)

April 15, 1941.

Incidence of Rabies in Switzerland

Until 1900 persons bitten by mad dogs had to be sent to the Pasteur Institute in Paris for treatment. Between 1891 and 1895 there were 58 such cases. In 1900 an antirabies center was organized in the Institute for the Study of Infectious Diseases in Berne, and hospitalization facilities were provided in the university clinic. This center is under the direction of the head of the university department of hygiene and bacteriology. Its functions are the vaccination of bitten persons and animals, prophylactic inoculation and diagnosis, and scientific research. In a report on the activities of this center during the years 1900-1939 it was pointed out that all cases of rabies were sporadic ones. Occasional epidemics of small scope occurred in border cantons and were due to importation. Swiss law does not make rabies a notifiable disease, nor is vaccination against rabies compulsory. The incidence of rabies has greatly decreased in Switzerland as in other countries as the result of the efficacy of vaccination and the prophylactic and veterinary measures now generally practiced. The mortality rate in Switzerland, which was never high, shows a decline from ten deaths in the decades between 1881-1890 to six in 1891-1900, one in 1901-1910, three in 1911-1920, two in 1921-1930 and no fatality since 1930. Patients are divided into four categories (A, B, C, D) in accordance with the divisions prepared by the Health Organization of the League of Nations. Classification depends on whether the offending animal was recognized to be rabid either experimentally or clinically or was or was not suspected of rabies.

In the forty years during which the institute has functioned, 394 persons have been treated. These were distributed over

the four categories as follows: category A 194 cases (49.2 per cent), B 16 cases (4.1 per cent), C 64 cases (16.2 per cent) and D 120 cases (30.5 per cent). More males were bitten than females; 25 per cent of all patients were children. Arm bites were most frequent; leg bites followed. In 62 per cent of the cases the wound was inflicted on the unprotected skin. However, the injury was a deep one in only 16 per cent of the cases. Eighty-four per cent were treated within the first two weeks after trauma, most of them within the first week. Most treatments were given in Berne. In other cases, vaccines were freshly prepared daily so that the maximum time interval between preparation of the vaccine and its administration was about six hours. At least 210 of the 394 patients were known to be bitten by a rabid dog or licked with its tongue. There was only one death (0.25 per cent) from rabies after treatment. Of the 394 cases, 355 were dog bites, 35 cat bites, 2 morsus humanus, 1 fox bite and 1 rabbit bite. Two hundred and twenty-three of the biting animals were killed at once. Their killing hindered a thorough analysis of the case.

The vaccine used is a modification of that used by Pasteur and Calmette. Eighteen daily injections are usually given; in serious cases, twenty-one.

Sixty Year Old Quadruplets

A familial study was recently made by Dr. Otto Schlaginhausen of quadruplets now 60 years old, still in good health and in part occupationally active. Their name is Gehri. They were born Sept. 26, 1880 in Oberlindach, a small town in the canton of Berne. Their mother was 39 years old at the time and subsequently bore three more children. The quadruplets weighed 6,720 Gm. at birth. Oscar, the first born, weighed 2 Kg. and was 43 cm. long. Bertha weighed 1,250 Gm. and was 39 cm. long; Rosa weighed 1,750 Gm. and was 40 cm. long. Arthur, who weighed 1,500 Gm. and was 40 cm. long, had to be animated artificially. The birth process covered five and one-half hours. In view of the placental condition reported by the obstetrician and the dissimilarity, which increased with the years, it is assumed that four different ova were involved. Oscar attained a size of 172 cm.; the others varied from 153 to 158 cm. The children borne subsequently by the same mother were considerably larger. The cranial and facial formation of the quadruplets is noticeably narrower than that of their brothers and sisters born later and is ascribed to an intra-uterine origin. Oscar and Arthur gave a vertex presentation, Rosa and Bertha a foot presentation. Schlaginhausen, in conducting this familial study, found that plural births had occurred in the ascending lines of both the father and the mother.

Sulfonamide Drugs Now Under Prescriptive Control

The federal Swiss government has recommended to the cantonal boards of health that they make medical prescription for all drugs containing sulfonamide ingredients obligatory. This action was taken because of the ill effects reported for random lay use. According to Swiss law, the various cantons have their own jurisdiction in matters of this kind. However, they generally adopt the recommendations of the federal government.

Brief Mention

The award made annually by the faculty of medicine of the University of Berne for research on encephalitis will be made retroactively to Dr. B. Discertori of Trient, Italy, for 1938 and to Prof. G. Panegrossi of Rome for 1939. Panegrossi has worked extensively on the so-called Bulgarian cure, an extract prepared from the roots of Bulgarian belladonna.

Dr. H. Henneberg was chosen to succeed Professor de Seigneux as professor of gynecology and director of the dispensary for obstetrics and gynecology at the University of Geneva.

Prof. Gustav Roussy, rector of the University of Paris and a native Swiss, was retired from office, apparently for racial considerations. Roussy was professor of pathologic anatomy and was known for his cancer research. He was the founder of a cancer research center in Paris.

Deaths

Prof. Edouard Claparède died in Geneva, aged 67 years. He was the founder of the Jean Jacques Rousseau Institute. His chief interest lay in child psychology. Nearly all his contributions, dealing with subjects such as sleep, hysteria and hypnosis, appeared in the *Archives de psychologie*, which he edited for some forty years at great expense to himself. Among his books may be mentioned "L'éducation fonctionnelle" and his "Psychologie de l'enfant et pédagogie expérimentale" which appeared in seven editions and was translated into ten languages. Claparède was an inspiring teacher whose scientific modesty was unspoiled by the many honors bestowed on him.

Prof. Max Nadoleczny died in Zurich at the age of 68 years. Though a native of Zurich, he spent most of his academic life in Munich, where he was on the staff of the faculty of medicine. He became well known for his research and therapies in speech disorders. He was retired several years ago because of changed political conditions in Germany and returned to his native city.

Prof. Hans Wildbolz, professor of urologic-surgical diagnosis in the faculty of medicine and head physician of a hospital division, died at the age of 68 in Berne toward the end of last year. He had been Kocher's assistant, early began to specialize in urologic surgery and was regarded as one of the leading urologists. His textbook and monographs were widely known. In his death Switzerland lost one of its distinguished physicians and a man held in highest personal esteem.

Marriages

VINCENT FRANCIS BIONDO, A. Surg. Lieut. (j. g.), United States Navy, New York, to Miss Katherine Maria Ryan of Berkeley, Calif., in Oakland, Calif., May 17.

ROSS C. SPEIR JR., Lieutenant (j. g.) Medical Corps, United States Navy, San Diego, Calif., to Miss Miriam Olds of Lansing, Mich., April 12.

STERLING P. HOFFMANN JR., Fort Wayne, Ind., to Miss Helen Inez Ferguson of Jeffersonville in Indianapolis, April 5.

AMOS R. GARRISON, Byington, Tenn., to Mrs. Lonnie B. Glenn of Tampa, Fla., in Chattanooga, Dec. 26, 1940.

DUNCAN GRAHAM CALDER JR., Charlotte, N. C., to Miss Mary Frances Barnhardt, Concord, April 19.

CURTIS B. NESSA, St. Cloud, Minn., to Miss Gertrude Woldrick in Medicine Lake, April 19.

KENNETH C. NICKEL, Detroit, to Miss Margaret Buechler of South Euclid, Ohio, February 22.

JOHN WATKINS WILLIAMS JR. to DR. ALYCE MARY ARRETEIG, both of Pineville, La., April 18.

BRUCE RANKIN McCAMPBELL, Fountain City, Tenn., to Miss Faye Williams of Memphis recently.

MARSHALL LOUIS MICHEL JR., Biloxi, Miss., to Miss Nancy Shaw of New Orleans in April.

ALBERT LOUIS EVANS, Sandersville, Ga., to Miss Lena Lovett of Wrightsville, Dec. 27, 1940.

JAMES REGINALD MYERS to Miss Barbara Jean Blackburn, both of Everett, Pa., June 4.

GERRIT JOHN BUDDINGH to Miss Alice Mitchell, both of Nashville, Tenn., May 28.

ARTHUR T. BLACHLY to Mrs. Gertrude A. Brown, both of Portland, Ore., June 7.

AUBREY WAYNE ELSTEN, Lapel, Ind., to Miss Anna Harting of Elwood, April 26.

MICHAEL BOLEY to Mrs. Marcella Shannon, both of Chicago, June 4.

Deaths

Walter Gustav Stern ☉ Cleveland; Western Reserve University Medical Department, Cleveland, 1898; chairman of the Section on Orthopedic Surgery of the American Medical Association, 1928-1929; vice president of the American Orthopaedic Association in 1918; past president of the Clinical Orthopaedic Society; member of the American Academy of Orthopaedic Surgeons; charter member of the International Society of Orthopedic Surgery; fellow of the American College of Surgeons; lecturer of orthopedic surgery at the Cleveland College of Physicians and Surgeons, medical department of Ohio Wesleyan University, from 1906 to 1911; orthopedic surgeon, Lutheran Hospital, Holy Cross Home for Crippled Children and the Jewish Orphan Asylum, Cleveland, and the Gates Hospital for Crippled Children, Elyria; consulting orthopedic surgeon, St. John's, Mount Sinai and Glenville hospitals, Cleveland, and Bedford Municipal Hospital, Bedford; aged 66; died, June 8, of coronary thrombosis.

James Hugh Earley, Washington, D. C.; University of Michigan Medical School, Ann Arbor, 1922; member of the Medical Society of the District of Columbia; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; associate professor of clinical otorhinolaryngology, Georgetown University School of Medicine; otolaryngologist, Episcopal Eye, Ear and Throat Hospital, Georgetown University Hospital, Providence Hospital, and the Gallinger Municipal Hospital, Washington, and the Tuberculosis Sanatorium, Glenn Dale, Md.; aged 44; died, May 9, of heart disease.

Frederick Augustus Faust ☉ Colorado Springs, Colo.; New York Homeopathic Medical College, New York, 1886; on the staffs of the Glockner Hospital, Beth El Hospital and St. Francis Hospital; aged 76; died, May 8, in St. Joseph's Hospital, Denver, of coronary sclerosis.

Alphonse Lessard, Quebec, Que., Canada; Laval University Faculty of Medicine, Quebec, 1895; professor of sanitary legislation at his alma mater; director of the Provincial Bureau of Health; past president of the Canadian Public Health Association; aged 69; died, April 27.

Rodes Estill Yager, Big Timber, Mont.; Johns Hopkins University School of Medicine, Baltimore, 1918; served during the World War; aged 48; died, May 6, in a hospital at Billings of pulmonary embolism and coronary disease.

Harold Kalling, Black River Falls, Wis.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1904; served during the World War; aged 71; died, March 9, in the Veterans Administration Facility, Hines, of pernicious anemia.

Edgar Allen Whitmer, Louisa, Ky.; Starling Medical College, Columbus, 1900; veteran of the Spanish-American War; aged 65; died, May 10, in the White Cross Hospital, Columbus, Ohio, of coronary occlusion.

J. Frederick Hill, Waterville, Maine; Medical School of Maine, Portland, 1885; member of the Maine Medical Association; on the staff of the Thayer Hospital; aged 86; died, May 1, of uremia and arteriosclerosis.

Vincent Aloysius Eagen ☉ Far Rockaway, N. Y.; Long Island College Hospital, Brooklyn, 1922; on the staff of St. Joseph Hospital; aged 42; died, May 14, in the Presbyterian Hospital, New York, of brain tumor.

Howard Miles Smiley, Lewistown, Pa.; Jefferson Medical College of Philadelphia, 1897; aged 72; died, May 8, in the Geisinger Memorial Hospital, Danville, of arteriosclerosis, hypertension and uremia.

Louis Edgar Deary, Bayonne, N. J.; Bellevue Hospital Medical College, New York, 1894; member of the Medical Society of New Jersey; on the staff of the Bayonne Hospital; aged 69; died, May 4.

George Reed Carroll, Lillie, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1897; aged 69; died, May 8, in a hospital at New Orleans of pulmonary tuberculosis and empyema.

Elias W. Ragsdale, Tignall, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1890; member of the Medical Association of Georgia; aged 70; died, April 26, of coronary occlusion.

Robert Rufus Robinson, Los Angeles; Meharry Medical College, Nashville, Tenn., 1918; aged 54; died, April 11, of bronchopneumonia following cerebral hemorrhage and hypertension.

Philip Guzzetta, Milwaukee; Regia Università degli Studi di Palermo Facoltà di Medicina e Chirurgia, Italy, 1896; aged 71; died, May 4, of adenocarcinoma of the tongue and cervical glands.

Brown Word, Leesville, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1908; bank president; formerly sheriff and parish coroner; aged 58; died, April 8.

Arthur R. Kresler ☉ Rensselaer, Ind.; Medical College of Indiana, Indianapolis, 1902; past president of the Jasper-Newton Counties Medical Society; aged 63; died, May 5.

George Reuben Smith, Woonsocket, R. I.; University of Vermont College of Medicine, Burlington, 1882; member of the Rhode Island Medical Society; aged 84; died, May 12.

Lee E. Parr, Beeville, Texas; Eclectic Medical Institute, Cincinnati, 1884; University of Tennessee Medical Department, Nashville, 1889; aged 83; died, April 22, in San Antonio.

Pierron Willets Bergen, Long Island City, N. Y.; New York Homeopathic Medical College and Flower Hospital, New York, 1912; aged 50; died, May 1, of heart disease.

Bernard Sour ☉ New York; College of Physicians and Surgeons, medical department of Columbia College, New York, 1893; aged 71; died, May 7, of coronary thrombosis.

Colvin Ketchum, Nokomis, Sask., Canada; University of Alberta Faculty of Medicine, Edmonton, Alta., 1938; served during the World War; aged 52; died, March 25.

Otis M. Turner, Sumner, Ill.; Eclectic Medical Institute, Cincinnati, 1898; at one time mayor; aged 72; died, April 28, in Anna (Ill.) State Hospital of arteriosclerosis.

James Steffens, Chicago; American College of Medicine and Surgery, Chicago, 1905; aged 65; died, May 11, in the Veterans Administration Facility, Hines, Ill.

Wilson A. Russell, Hardin, Mont.; Chicago Homeopathic Medical College, 1897; past president of the Big Horn County Medical Society; aged 68; died, April 29.

John Edwin Trierweiler ☉ Yankton, S. D.; John A. Creighton Medical College, Omaha, 1912; served during the World War; aged 52; died, April 17.

Laura Jennings Cloud, Indianapolis; Physio-Medical College of Indiana, Indianapolis, 1885; aged 85; died, May 11, of coronary occlusion and arteriosclerosis.

Jesse M. Willis, Williston, Fla.; Louisville (Ky.) Medical College, 1892; mayor; aged 76; died, April 23, in a hospital at Ocala of cerebral hemorrhage.

David Heilman Schall, Canton, Ohio; National Normal University College of Medicine, Lebanon, 1896; aged 77; died, May 1, in the Mercy Hospital.

Charles P. Roberts, Galveston, Texas; University of Texas School of Medicine, Galveston, 1905; aged 60; died, April 20, in a hospital at San Antonio.

Claudius Cameron Joyner, Farmville, N. C.; Jefferson Medical College of Philadelphia, 1899; aged 68; died, May 2, of coronary thrombosis.

William Forrester Satchell, Long Beach, Calif.; Hahnemann Medical College and Hospital of Philadelphia, 1901; aged 64; died, April 24.

Robert H. Kilpatrick Kirk, St. Louis; Missouri Medical College, St. Louis, 1887; aged 78; died in April of nephritis and myocarditis.

Carter McVine Tobey, De Pere, Wis.; New York Homeopathic Medical College, New York, 1877; aged 91; died, April 25.

Gertrude Greenstein, New York; New York Medical College and Hospital for Women, New York, 1914; aged 54; died, May 14.

Virginia Chenoweth Rigg, Medford, Ore.; Keokuk (Iowa) Medical College, 1892; aged 87; died, April 26, of bronchopneumonia.

Charles Edgar Wilson, Oshawa, Ont., Canada; University of Toronto Faculty of Medicine, 1915; aged 51; died, April 20.

Wilborn Roper Winter, Lebanon, Tenn.; University of Nashville (Tenn.) Medical Department, 1890; aged 73; died, April 11.

John Malcolm Chapman, Greenville, S. C.; University of Nashville (Tenn.) Medical Department, 1909; aged 53; died, April 27.

Walter Jacob Snyder, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia; 1903; aged 61; died, April 26.

Bureau of Investigation

CHARLES AUGUSTUS de VERE, SELF-STYLED ANATOMIST

During the past few years inquiries have been received, both by the Bureau of Investigation of the American Medical Association and by the Board of Medical Examiners of the State of California, in regard to one C. Augustus de Vere, who gives review courses in the anatomy of the head and neck to physicians. It is interesting to note a report of an investigation of de Vere by J. W. Williams, an agent of the California Board, which is abstracted herewith:

On March 17, 1941, C. Augustus de Vere was arrested in Colfax, Calif., for violation of section 2141 of the Business and Professions Code (section 2141 deals with the use of the prefix "Dr." and the suffix "M.D." on signs and advertising by individuals not licensed in the state of California as Doctors of Medicine). Actually, his advertising material carried the heading "C. Augustus de Vere, M.D., New York City, Director of Anatomy, Division of Educational Courses," and added, in a rubber stamp, "609 Professional Building, Los Angeles, California."

The January issue of *California and Western Medicine* carried an article regarding his activities and claims and noting that the American Medical Association and Columbia University had no record of him. Nevertheless, at the time of his arrest he claimed to hold a certificate from the Physicians and Surgeons College of New York, stating that he had graduated therefrom in 1918 but had never obtained a license to practice medicine in any state. He did not appear to be aware of the fact that the College of Physicians and Surgeons was the medical division of Columbia University. He claimed he had left New York in 1934 to attend a medical convention in Cleveland, and from there had proceeded on a tour of the Southern and Western states, giving lectures on anatomy, which had taken him through Georgia, Florida, Texas, Arizona and finally to California, where he had conducted these activities for the past three years.

A search was made of de Vere's automobile, and it was found to contain wet specimens, including some twenty-seven human heads, hands, arms, hearts, brains and prepared skulls, among other things. On the evening of his arrest he claimed to have obtained all of the specimens in Cleveland but refused to divulge the source from which he obtained them. He also mentioned during his conversation the "mad killer of Kingsbury Run" of Cleveland, who was said to have been responsible for twenty-seven headless bodies having been found in that city during the years 1935 and 1936, and said that he had been told by friends that, should he ever be picked up for questioning and all the specimens found, he might be accused of being responsible for those murders.

The California authorities wrote to the chief of police of Cleveland, requesting any information on the subject. The Cleveland police had no record of de Vere but forwarded photostatic copies of handwriting and an unsigned typewritten note mailed on Dec. 22, 1939 from the Arcade Annex Post Office in Los Angeles, in which the writer advised the chief that he need not worry further about additional murders in the city of Cleveland, as he (the writer) was now carrying on his operations in "Sunny California." California authorities made careful investigation of the handwriting and the typewritten note, but although the handwriting, phraseology and punctuation of the note regarding the murders were quite similar to those of letters written by de Vere, the experts examining them decided that the note was not that of the defendant.

In de Vere's possession at the time of his arrest was an address, "Dr. C. Augustus de Vere, 317 Fremont Avenue, Apartment 8, Jersey City, New Jersey." This was found to be the address of the subject's mother, and it was determined that his true name was Charles Augustus Devermann. His mother had never known of her son's having been a doctor, and, so far as she knew, he had only completed a grammar school education and attended night school in New York for a short time.

The subject was also using letterheads with the address "219 East 44th Street, New York City," which was found to be a twelve floor loft building owned and occupied by the New York *Evening Sun*. The New York authorities were asked for information on Charles Augustus de Vere and sent complete records on an individual known as Charles de Vere, New York Police Department, No. 88288, with numerous aliases and sixteen arrests and convictions throughout New York, Illinois, Ohio, Missouri, Iowa, Florida and Pennsylvania, for crimes ranging from grand larceny to confidence man. "Strangely enough," states the report of the California investigator, "this individual proved to be different from the one investigated in California, although the New York criminal's name was the same as the alias taken by the subject, and his general description was similar."

A third statement taken from the subject on April 2, 1941 contained the admission that he was a fake, with no bona fide medical training, that he was using an alias in place of his true name, and that he had obtained what knowledge he had of anatomy through his connection with a manufacturer and distributor of anatomic slides. He also divulged that he had been in conflict with the law in the Dominion of Canada and had considerable trouble getting out of these difficulties.

A careful examination was made of the wet specimens found in the defendant's car, and two of the hands were identified as belonging to Wallace Johnstone, alias John Anderson, an ex-convict who served time in the Washington state penitentiary in 1917 for grand larceny and who had committed suicide in Palo Alto, Calif., in 1935. The body had been turned over to Stanford Medical School for scientific purposes, which school had turned it over to the San Francisco College of Physicians and Surgeons School of Dentistry, and it was from the dean of that college that de Vere had obtained the hands. According to the California agent, other parts of the human body found in de Vere's possession were subsequently traced to the Department of Anatomy of the University of Cincinnati, where de Vere had obtained them in 1934.

De Vere pleaded guilty to charges of holding himself out as a physician and surgeon in the state of California, whereupon the court fined him \$100. The charge of possessing hypodermic needles was dismissed by the court at that time, and the defendant promised to leave California immediately and not again attempt to carry out his activities in that state. Finally, de Vere was said to have proceeded eastward immediately after being released from the Placer County jail, where he was in custody pending his trial from March 17 until April 11, 1941. The special agent's report concludes: "Although we apparently have succeeded in driving this impostor from the state of California, he is undoubtedly continuing his activities in other states, as he so stated to the district attorney in Auburn upon his release."

Success and Failure of Suicides.—"More than 18,000 people a year in this country put an end to their own lives, and probably an additional 100,000 make unsuccessful attempts to kill themselves" says the May issue of the Statistical Bulletin of the Metropolitan Life Insurance Company. More women than men attempt suicide, but three times as many men as women are successful. More than half of the women are under 30 years of age, but only a quarter of the men. The younger the person, the less apt he is to succeed. Only one out of every six men under 25 who attempt self destruction is successful, whereas at ages 50 and over the ratio is two out of three. Three fourths of the women use poison, which is designated as the least efficient method. Men are more inclined to select violent methods, such as drowning, shooting, hanging or jumping from high places. In many cases it is difficult to determine the motive of suicide, but from what information is available it would appear that ill health, domestic troubles, financial difficulties and despondency over life in general are the most frequent reasons. The efforts that have been made by social and medical agencies to prevent suicide seem to have produced little effect, but it is suggested that "a well organized and concerted program can do much to prevent this needless loss of life."

Correspondence

UTILITY OF ANIMAL BLOOD IN PREPARATION OF PLASMA FOR TRANSFUSION

To the Editor:—The possible utility of solutions of albumin prepared from the blood of domestic animals as a substitute for blood has been mentioned recently by Cohn (*Chem. Rev.* 28:395, 1941). Cohn has not indicated any results of biologic trials and states that study will be needed to see whether such albumins will, in fact, remain in the blood stream and attract or hold water there by virtue of their colloid osmotic pressure. In view of the potential wartime importance of such preparations, we wish to offer some pertinent information on this and other points from studies extending over the past four years in the Laboratory of Physiological Hygiene of the University of Minnesota.

We have prepared serum, plasma and plasma albumins and globulins under sterile conditions by precipitation methods with ammonium sulfate, phosphates and alcohols and by extraction methods with alcohols. The donor animals have included the cow, horse, sheep and goat as well as other animals of only theoretical interest, such as the dog, rabbit, guinea pig and fox. The molecular weights of the albumins have all been between 68,000 and 72,000.

These heterologous proteins have been studied by intradermal and intravenous injection methods in both man and animals. The influence of products of bacterial metabolism and of chemical preservatives on the incidence of reactions also has been studied. The persistence of the foreign protein in the blood has been followed by specific precipitin methods. The following statements may be made:

1. We have been unable to find any natural protein fraction in animal plasmas which will not cause reactions in some persons.

2. The incidence of natural sensitivity to these animal blood proteins varies over a wide range, depending on the donor species. In all cases the albumin fractions produce fewer and less severe reactions than the globulin fractions or the native plasma or serum.

3. Persons who are sensitive to the albumins of one animal species are not necessarily sensitive to those of another species, so that if there is a choice of several animal plasma albumins almost all persons will be able to receive one of these.

4. These heterologous albumins do not escape from the blood stream in significant amount and apparently behave, physically, precisely like the recipient's own plasma albumin.

5. Animals in shock from hemorrhage can be readily revived by the intravenous injection of an amount of foreign plasma albumin equal to that lost in the hemorrhage. If the albumin is administered in concentrated solution, it draws water from the tissues and so restores the blood volume.

6. Such foreign albumins persist in the blood stream in large amounts for some days and may be detected there for as long as three weeks.

7. Sensitization of both man and animals to these foreign proteins occurs readily with both albumins and globulins.

8. We have found no differences in sensitivity to albumins from different individual donor animals of the same species.

9. The metabolism of bacteria, including common air-borne, cryophilic forms, may greatly increase the incidence of reactions to such protein solutions, even though gross contamination is avoided and the final solution injected is sterile.

10. Fifteen minute cutaneous tests provide a valuable guide to the selection of a foreign albumin solution for administration to a given individual. Most of the common serum preservatives interfere with such tests by producing a high incidence of false positive reactions.

ANCEL KEYS, PH.D.
HENRY L. TAYLOR, B.A.
GEORGE M. SAVAGE, PH.D.
Minneapolis.

BLOOD PRESSURE

To the Editor:—There has been brought to my attention the review in your issue of April 26 of the "Blood Pressure Study (1939)," published by the Joint Committee of the Association of Life Insurance Medical Directors and the Actuarial Society of America. One of the most important investigations ever made of this subject has been dismissed in a review of thirty-five lines, one half of which is devoted to a minor point.

For the first time an analysis has been published of a large experience in which both systolic and diastolic readings have been taken into account. The results show that neither the diastolic nor the systolic is the more important factor. This may be learned from the study, together with other indications such as that a low systolic with a low diastolic blood pressure shows a favorable mortality. In the following table the per-

Systolic	Diastolic 84-88					Diastolic 89-93					Diastolic 94-98				
	Ages					Ages					Ages				
	10-29	30-39	40-49	50	Up	10-29	30-39	40-49	50	Up	10-29	30-39	40-49	50	Up
128-132	95	165	93	94	96	120	101	89	160	90	91	96			
133-137	95	115	104	96	135	141	116	94	...	152	129	95			
138-142	107	118	131	104	...	137	139	116	...	182	165	130			
143-147	...	169	138	120	...	114	163	123	...	...	199	146			
148-157	...	...	203	153	...	155	211	148	...	249	201	180			
158-167	...	...	...	183	...	...	221	191	...	...	390	212			

centages refer to departures from the normal mortality of 100 per cent; accordingly, 95 per cent would mean a mortality 5 per cent better than the normal and 160 per cent would be 60 per cent worse than it. Where the percentages are not given, there was not sufficient material to justify publication.

The foregoing indicates that a comparatively small increase in the systolic over the average pressure on standard lives results in a material increase in the mortality. Where the systolic and diastolic are both high, say 148-157 and 94-98 respectively, at ages 40-49, the mortality is twice the normal.

A table in the report which would interest physicians shows the deaths from cardiovascular renal diseases compared to the deaths from all causes:

Deaths from Cardiovascular Renal Diseases: Proportion to All Deaths

Systolic Reading	Diastolic Reading		
	54-53	84-93	94-116
103-132	32 per cent	33 per cent	39 per cent
133-142	40 per cent	45 per cent	48 per cent
143-177	49 per cent	51 per cent	69 per cent

It may be difficult for a busy physician to find time to study the foregoing tables, but they give information which is not available elsewhere.

ARTHUR HUNTER, New York.
Chairman, Joint Committee on Mortality Association of Life Insurance Medical Directors and Actuarial Society of America.

Medical Examinations and Licensure

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS
EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, June 28, page 2885.

BOARDS OF MEDICAL EXAMINERS

CALIFORNIA: Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, July 14. *Written*. Los Angeles, July 14-17. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

CONNECTICUT: * *Medical*. *Written*. Hartford, July 8-9. *Endorsement*. Hartford, July 22. Sec., Dr. Creighton Barker, 258 Church St., New Haven. *Homoeopathic*. Derby, July 15-16. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: July 8-10. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

HAWAII: Honolulu, July 14-17. Sec., Dr. James A. Morgan, 48 Young Bldg., Honolulu.

IDaho: Boise, Oct. 7. Dir., Bureau of Occupational License, Mr. Walter Curtis, 355 State Capitol Bldg., Boise.

MASSACHUSETTS: Boston, July 8-11. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MONTANA: Helena, Oct. 6-8. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEVADA: *Reciprocity with oral examination*, Aug. 4. Sec., Dr. Fred M. Anderson, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, Sept. 11-12. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW MEXICO: Santa Fe, Oct. 13-14. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

OREGON: * Portland, July 24-26. Final date for filing application is July 9. Exec. Sec., Miss Lorieue M. Conlec, 608 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 8-12. Act. Sec., Bureau of Professional Licensing, Department of Public Instruction, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

RHODE ISLAND: * July 10. Acting Chief, Division of Examiners, Mr. E. Clyde Thomas, 366 State Office Bldg., Providence.

SOUTH DAKOTA: * Pierre, July 15-16. Dir., Medical Licensure, Dr. J. F. D. Cook, State Board of Health, Pierre.

WASHINGTON: * Seattle, July 21-23. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

WEST VIRGINIA: Wheeling, July 7-9. Sec., Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

DISTRICT OF COLUMBIA: Washington, Oct. 20-21. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

IOWA: Des Moines, July 8. Dir., Division of Licensure and Registration, State Department of Health, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

NEBRASKA: Lincoln, Oct. 7-8. Dir., Bureau of Examining Boards, Mrs. Jeannette Crawford, 1009 State Capitol Bldg., Lincoln.

OREGON: Corvallis, July 12. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Aug. 20. Acting Chief, Division of Examiners, Mr. E. Clyde Thomas, 366 State Office Bldg., Providence.

WASHINGTON: Seattle, July 17-18. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

Alabama Reciprocity Report

The Alabama State Board of Medical Examiners reports 15 physicians licensed to practice medicine by reciprocity and 3 physicians so licensed by endorsement of credentials of the National Board of Medical Examiners from January 1 through April 18. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Howard University College of Medicine.....	(1937)		Tennessee
University of Georgia Medical Department..	(1924), (1932)		Georgia
Rush Medical College	(1937)		Illinois
University of Illinois College of Medicine.....	(1935)		California,
(1939) Texas			
Johns Hopkins University School of Medicine.....	(1924)		Maryland
University and Bellevue Hospital Medical College....	(1924)		New York
University of Pennsylvania School of Medicine.....	(1931)		Penna.
Meharry Medical College.....	(1938)		Tennessee
Memphis Hospital Medical College.....	(1906)		Tennessee
University of Tennessee College of Medicine.....	(1938)		Mississippi,
(1939) Tennessee			
Vanderbilt University School of Medicine.....	(1924)		Tennessee
University of Virginia Department of Medicine.....	(1935)		Virginia
School	LICENSED BY ENDORSEMENT	Year Grad.	
George Washington University School of Medicine.....	(1938)		
University of Minnesota Medical School.....	(1931)		
Duke University School of Medicine.....	(1938)		

Bureau of Legal Medicine
and Legislation

MEDICOLEGAL ABSTRACTS

Medical Societies: Expulsion Invalid if Voted at Meeting Not Attended by Quorum.—Charges were preferred with the committee on grievances of the Kern County (Calif.) Medical Society that Smith, a member of the society, was "guilty of disposing of his services under conditions that make it impossible to render adequate service to his patients and . . . [was] guilty of disposing of his services under conditions which interfere with reasonable competition among physicians in the community where he lives and practices." A copy of the charges was timely served on the physician and he was notified of the time and place of a hearing on those charges, which was set by the committee for Oct. 3, 1935. He did not appear at the hearing and the committee proceeded in the matter. As required by the by-laws of the society, the committee submitted a written report of the hearing to the board of directors of the society, which in turn notified the physician that it proposed to act on the committee's report November 12. He likewise failed to appear at that hearing, and, after considering the report of the committee on grievances, the board of directors sustained the charges and voted to expel him from the society. Apparently by the by-laws of the society, before the action of the board can become effective it must be sustained by the society. Accordingly, at a meeting of the society held November 21 the matter was considered, twenty members voting to sustain the board and to expel Smith and two members voting adversely to the action proposed by the board. The physician appealed successively to the council of the California Medical Association and to the Judicial Council of the American Medical Association but both of those bodies affirmed the order of expulsion. Subsequently he applied unsuccessfully to the superior court, Kern County, for a writ of mandamus to compel his reinstatement as a member in the society. He then appealed to the district court of appeal, fourth district, California.

The physician questioned the legality of his purported expulsion because of the absence of a quorum at the meeting of the society on November 21, which had voted twenty to two to expel him. He maintained, and correctly in the view of the district court of appeal, that three purported members who voted at that meeting were not qualified members because "they had not signed the constitution and by-laws, which act was made a prerequisite to membership" in the society. It is clear, said the district court, that there were only nineteen members of the defendant society present at the time of the vote of expulsion. The records of the society indicate that forty-two members were signers of the constitution and by-laws. Three of these had been suspended and the by-laws prohibited the petitioner from voting. While the constitution and by-laws of the society do not specify the number of members necessary to constitute a quorum, the by-laws adopt Robert's Rules of Order, by which a majority of the members of an organization constitutes a quorum. As there were only nineteen of the members of the society in attendance at the meeting when the motion to expel was put to a vote, there was not a quorum present even though one regards the membership of the society at that time as only thirty-eight. Since the presence of a quorum is necessary for the transaction of business, it follows that no motion to sustain the action of the board of directors in expelling the physician was carried.

In California, continued the court, the courts will not interfere with the internal economy, rules of membership or rules of procedure or discipline of members of a strictly fraternal or social unincorporated voluntary organization in which the members have no severable or divisible proprietary interest in any portion of its property and where the members' interest in the property of the organization is only an incident of membership since the courts have no standards by which to determine the propriety of such rules. Only when there is an allegation that

there has been an unreasonable and arbitrary invasion of private rights will the courts interfere, and even then the inquiry generally will be limited to a determination as to whether or not the society in adopting the action in question has conformed to its own rules of procedure. The scope of such a court inquiry will be limited by a recognition and application of the following rules of law: 1. The constitution and by-laws of the society constitute a contract between the association and its members. 2. A person may, by contract, waive his legal rights. 3. When a member has been given a fair trial before the tribunals of the society according to the procedure established by it, the courts will not interfere. 4. Proceedings in such societies are not bound about by technicalities and strict rules of procedure and interpretation are not legally required. 5. Membership in such an association is not a right that can be demanded but is a privilege that may be granted or withheld on the terms and conditions imposed by the society. 6. An illegal motive will not render a lawful act unlawful.

The physician further contended that the members of the committee on grievances and of the board of directors were so prejudiced against him as to disqualify them from conducting the proceedings against him. As no bodies, answered the district court, other than those referred to were available under the society's organizational law with power to conduct hearings on disciplinary matters, it thought regardless of whether or not individual members were prejudiced that they had power to determine the matter, citing *Nider v. Homan*, 32 Cal. App. (2d) 11, 89 P. (2d) 136, which in turn quotes from 39 A. L. R. 1476 as follows:

By the great weight of authority, a judge or an officer exercising judicial functions may act in a proceeding wherein he is disqualified by interest, relationship, or the like, if his jurisdiction is exclusive and there is no legal provision for calling in a substitute, so that his refusal to act would prevent absolutely a determination of the proceeding.

Since it appeared from the record, in the opinion of the district court, that because of a lack of a quorum present at the meeting of the Kern County Medical Society at which the vote of expulsion was taken the rules of the society were not followed in the proceedings which resulted in the physician's expulsion, the court concluded that he was never legally expelled and, in effect, ordered his reinstatement to membership in the Kern County Medical Society.—*Smith v. Kern County Medical Association et al.*, 112 P. (2d) 268 (Calif., 1941).

Malpractice: Alleged Negligent Application of Heat in Treatment of Phlebitis.—Soon after being confined to bed for about fifteen days following an appendectomy, the plaintiff suffered severe pain in the lower part of his left leg. The defendant physician, who was then called in on the case, made a diagnosis of phlebitis and advised the application of heat to the affected area. In accordance with his instructions a cradle made from barrel staves sawed in half to which two 40 and one 50 watt electric light bulbs were attached was placed over the injured leg and covered with a blanket to retain the heat of the lighted bulbs, which were 6 or 7 inches distant from the leg. An ice pack was placed on the groin, the foot was elevated and the patient was kept quiet. From time to time hypodermic injections were given to relieve pain. Before the cradle was constructed, the physician left the patient and did not see him again until the following day. Meanwhile, the heat was continuously applied. On the physician's return, he discovered a water blister of considerable size which had formed on the leg between the ankle and the thigh. Because of his discomfort, the patient asked that the cradle be removed. The physician refused to permit this, informing the patient that the cradle was necessary for proper treatment of the condition and that the water could not be drained from the blister. As the physician directed, the lights as originally installed remained burning in the cradle continuously for about three days, when three bulbs of 15 watts each were substituted. The cradle was then used for an additional eighteen days and removed. After the removal of the cradle the blister burst, and subsequently ulcers formed in the affected area of the leg. Later the patient sued the physician for malpractice, claiming that he had been negligent in "the manner of applying the treatment."

At the trial it appeared from the testimony of medical experts that phlebitis is a condition not infrequently resulting from operations and that in spite of the care taken by the operating physician it is unpredictable and unpreventable. As the court viewed the evidence, phlebitis occurs when a blood vessel has become obstructed or "occluded by virtue of a clot known as a thrombus," and the condition is indicated by swelling in affected areas, pain and oftentimes discoloration. Phlebitis sometimes causes blisters on the surface of the skin without the application of heat, sores and ulcers developing quite commonly. In the opinion of the medical witnesses, the disability of the patient at the time of the trial was traceable mainly to the thrombus, the scarification that was present was a "cosmetic factor more than anything else" and, although not usually the case, phlebitis would cause not only blisters but destruction of the tissue "to the point of gangrene" without any application of heat. According to those witnesses, applications are frequently given by a homemade contrivance, without thermometer or means of adjustment, such as the one used by the physician in this case. In response to a question asked one of the expert witnesses called by the patient as to whether or not in his treatment of such a condition following an abdominal operation he had ever advised an electric cradle and left the installation of it to the patient, or to laymen, he stated that he had done so frequently and that it was customary to advise the use of a device such as was employed by the physician in this case and to leave it to a layman to follow the instructions given. At the close of the evidence, the trial court directed a verdict in favor of the physician and the patient appealed to the Supreme Court of Florida, division A.

The Supreme Court was unable to find any evidence in the record that would have justified a verdict for the patient. The fact, said the Supreme Court, that a blister did result while treatment was being given and that ulcers later appeared on the diseased leg did not of themselves establish negligence on the part of the physician, since the doctrine of *res ipsa loquitur* has no application under the facts here present. The evidence introduced by the patient falls far short of proving any negligence on the part of the physician. While it is evident that the patient suffered intensely as a result of the remedy used in treating his illness, the fact remains that his leg which was so badly affected was saved. There was no testimony that his physical condition after his ordeal was traceable to aught but the severe phlebitis which followed the operation. Even by the testimony of witnesses called by the patient, it was established, in our opinion, that in this case the proper remedy was used properly. Since we believe that the patient failed in his attempt to fix on the defendant physician the responsibility for the injury he endured, we find no error in the action of the trial court in instructing a verdict for the physician. The judgment in favor of the physician was accordingly affirmed.—*Grubbs v. McShane*, 198 So. 208 (Fla., 1940).

Evidence: Conclusiveness of Blood Grouping Test as Evidence of Nonpaternity.—Where, said the court of appeals of Ohio, Guernsey County, the alleged father of an illegitimate child offers in evidence the results of a blood group test which disclosed that the reputed father could not be the father of the child, it is not error for the court to refuse the admission of such evidence as conclusive. It should be admitted along with other evidence for whatever weight it may have to prove the nonpaternity of the alleged father.—*State ex rel. Slovak v. Holod*, 24 N. E. (2d) 962 (Ohio, 1939).

Society Proceedings

COMING MEETINGS

- American Physiotherapy Association, Asilomar, Calif., July 13-18. Miss Evelyn Anderson, Stanford University, Calif., Secretary.
National Medical Association, Chicago, Aug. 18-22. Dr. John T. Givens, 1108 Church St., Norfolk, Va., General Secretary.
Washington State Medical Association, Seattle, Aug. 24-26. Dr. Vernon W. Spickard, 1305 Fourth Ave., Seattle, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

21:257-400 (March) 1941

- Physiologic and Physical Laws That Govern Auscultation and Their Clinical Application: Acoustic Stethoscope and Electrical Amplifying Stethoscope and Stethograph. M. B. Rappaport and H. B. Sprague, Boston.—p. 257.
- Effect of Reestablishment of Circulation in Completely Ischemic Kidneys on Blood Pressure of Cats, Dogs and Rats. H. A. Lewis, S. D. Leo and M. Prinzmetal, Los Angeles.—p. 319.
- Some Principles Governing Supply of Blood to Myocardium in Occlusive Arterial Disease. T. E. Lowe, Melbourne, Australia.—p. 326.
- New Piezoelectric Manometer to Record Intracardiac Pressures and for Simultaneous Recording of Intracardiac Electrograms. A. G. Macleod and A. E. Cohn, New York.—p. 345.
- Effect of Acetylcholine on Mammalian Heart. A. E. Cohn and A. G. Macleod, New York.—p. 356.
- Contrast Roentgen Visualization of Coarctation of Aorta. A. Grishman, M. F. Steinberg and M. L. Sussman, New York.—p. 365.
- Ball Thrombi in Heart: Report of Three Cases. C. F. Garvin, Cleveland.—p. 371.

American Journal of Clinical Pathology, Baltimore

11:175-262 (March) 1941

- Preparation and Preservation of Human Plasma: I. Collection of Blood and Separation of Plasma. M. M. Strumia, J. J. McGraw and J. Reichel, Bryn Mawr, Pa.—p. 175.
- *Diagnosis of Trichinosis by Skin and Precipitin Tests. J. B. McNaught, R. R. Beard and J. D. Myers, San Francisco.—p. 195.
- Effect of Colchicine on Chronic Myeloid Leukemia. J. T. Paul, W. O. Brown and L. R. Limarzi, Chicago.—p. 210.
- Evaluation of Urinary Quantitative Pregnanediol Determination. H. L. Reinbart, P. J. Reel and G. Y. Shinowara, Columbus, Ohio.—p. 219.
- Metals and Cardiovascular System. Z. T. Wirtschafter and M. H. Fineberg, Cleveland.—p. 229.
- Torulosis of Central Nervous System: Review of Recent Literature and Report of Case. C. H. Binford, Detroit.—p. 242.
- Primary Chorionepithelioma of Ovary. G. R. Backus and E. P. Griffin Jr., Flint, Mich.—p. 252.

Diagnosis of Trichinosis by Skin and Precipitin Tests.—McNaught and his co-workers performed cutaneous or precipitin tests with trichinella antigen on 266 persons. Among these were 36 patients with active clinical trichinosis, 36 ailing persons suspected of having trichinosis because of an eosinophilia and one or more symptoms compatible with trichinosis, and 194 persons hospitalized for conditions in no way suggesting trichinosis. Of the 36 patients with classic signs of trichinosis all but 1 eventually gave positive cutaneous reactions of the immediate type with trichinella antigen. The single negative reaction was in a moribund patient. Seventeen of the 36 persons with a probable diagnosis of trichinosis gave positive cutaneous tests. Among the 194 control persons 6.7 per cent gave immediate positive reactions and 18.1 per cent delayed reactions. Precipitin tests almost agreed with the cutaneous reactions. The delayed reaction occurs early in the infection and has also been seen in long standing quiescent cases. During the second or third weeks the reaction is immediate and consists of a wheal with a zone of erythema. It is the authors' experience that cutaneous and precipitin tests in trichinosis show as high a degree of sensitivity as any other clinical or laboratory procedure. The results of the tests must be interpreted with the same care exercised in interpreting the presence of trichinella in biopsies. Initial negative tests in patients who later show positive reactions should be particularly significant. The epidemiology, clinical picture, physical observations and laboratory tests must all be considered in making the diagnosis. Too much emphasis must not be attached to any one feature. Eosinophilia indicates but is not diagnostic of trichinella invasion. It is valuable in confirming the recent onset of an infection proved by cutaneous and precipitin tests.

American J. Obstetrics and Gynecology, St. Louis

41:355-546 (March) 1941. Partial Index

- Some Remarks About Maternal Mortality in the South. J. R. McCord, Atlanta, Ga.—p. 355.
- Theca Cone and Its Tropism Toward the Ovarian Surface, Typical Feature of Growing Human and Mammalian Follicles. E. O. Strassmann, Houston, Texas.—p. 363.
- Deep Cauterization of Cervix: Factor in Reducing Mortality of Hysterectomy: Six Year Survey. B. Z. Casbman and J. S. Frank, Pittsburgh.—p. 379.
- Effects of Analgesia on Newborn Infant. C. O. McCormick, Indianapolis.—p. 391.
- Nationality and Carcinoma of Cervix. F. R. Smith, New York.—p. 424.
- *Skin Test for Diagnosis of Pregnancy. F. H. Falls, V. C. Freda and H. H. Cohen, Chicago.—p. 431.
- Objections to Induction of Labor in Normal Pregnant Women. E. L. Cornell, Chicago.—p. 438.
- *Pubertas Praecox Due to Ovarian Tumors. C. B. Lull, Philadelphia.—p. 445.
- *Treatment of Pelvic Endometriosis. W. T. Dannreuther, New York.—p. 461.
- Effect of Combined Administration of Chorionic Gonadotropin and Pituitary Synergist on Human Ovary: Preliminary Report. C. Mazer and E. Ravetz, Philadelphia.—p. 474.

Cutaneous Test for Diagnosis of Pregnancy.—Falls and his associates describe a cutaneous test for diagnosis of pregnancy employing diluted colostrum from primiparous pregnant women. In a pregnant woman the wheal produced by the injection of 0.02 cc. of colostrum intradermally will appear pearly, resembling a fresh mosquito bite with little or no pinkish areola. The site of injection will scarcely be recognizable in an hour, except for the needle prick. A control injection of physiologic solution of sodium chloride produces no reaction beyond a raised area caused by the injection. When the patient is not pregnant the wheal remains raised and pearly until a few minutes after injection, when it increases in diameter and eventually becomes two to three times the original size, without changing color. Then a pink to red areola appears. It is from 1 to 2 inches in diameter and is irregular in contour, color and depth and projects lymphangitic pseudopodiums from its periphery. The reaction steadily grows in intensity for an hour and persists for four or five hours. The wheal of the control injection in nonpregnant women does not increase nor is the areola pigmented. Two hundred and sixty-five women in various stages of pregnancy were tested and the results compared with those of 358 nonpregnant persons (100 adult males, 45 children less than 15 years of age, 50 menstruating women, 50 postpartum cases, 113 normal nonpregnant women or women with various known gynecologic conditions and 50 unknown problem cases). Among the 265 pregnant women there were 5 false reactions; in 2 nonpregnancy reactions were obtained, and the other 3 were weak reactions not indicative of pregnancy. The weak reactions persisted for only forty-five minutes and disappeared within the hour contrary to the reaction seen in nonpregnancy. A weak or false nonpregnancy reaction differs from the true nonpregnancy reaction in the width of the areola and in color intensity, and the wheal does not enlarge after injection. It differs from a pregnancy reaction in that there is some color around the wheal. A similar reaction has been seen in the early puerperium and during labor. Of the 113 nonpregnant women tested, typical nonpregnancy reactions were obtained in all but 4. These 4 women were in the menopause for from five to seventeen years, 3 of them had advanced group 3 carcinomas of the cervix uteri and the fourth had a simple procidentia seventeen years after the last menstrual period. The 50 menstruating women gave nonpregnancy reactions. The reaction of the 45 children was similar to that seen in pregnancy; after the age of 10 modified nonpregnant reactions were seen in both males and females. None of the 100 men studied gave positive pregnancy reactions; 3 gave modified nonpregnancy reactions. All but 3 of the 50 postpartum women gave nonpregnancy reactions, whether or not they were nursing their infants. The 3 pregnancy reactions were in women eight weeks post partum; 1 was menstruating and 2 admitted exposure, but sufficient time had not elapsed to determine whether pregnancy existed. From the results it appears that nonpregnant persons have become sensitized to a specific protein contained in colostrum from primiparous women. The negative reactions in children before puberty suggest that they have not yet produced and absorbed enough of this protein to become sensitized to colostrum. The reaction of the adult males sug-

gests that the male breast secretes sufficient of the specific solution to sensitize but not to immunize. Older patients, both male and female, gave a reaction of diminished intensity which decreased with increased age. The test was applied to 50 problem patients in an effort to diagnose early pregnancy from one to three weeks after the first missed menstruation. In spite of the fact that early pregnancies may be present, may produce a reaction and may terminate by death and expulsion of the fetus without sufficient clinical evidence to prove or disprove them, a correct diagnosis was made in 46. In these, sufficient time has elapsed to prove the correctness of the test. Considerable familiarity with the test is necessary for the correct interpretation of the reactions. If the foregoing results are confirmed, the test will make the diagnosis of early pregnancy much simpler, quicker and more economical than the methods now used.

Pubertas Praecox Due to Ovarian Tumors.—Lull cites 2 cases of ovarian tumor associated with precocious puberty. He considered 1 of the tumors to be a typical granulosa cell tumor, the other a simple follicular cyst of the ovary. The fact that the second patient responded to operative procedure and returned to normal infantile type leads him to believe that surgical intervention is indicated in these tumors, even though they are not of the granulosa cell type. Functioning tumors of the ovary today represent such broad possibilities as to be of interest to the medical profession in general. From an endocrinologic point of view these tumors furnish definite evidence of hormone production and its clinical effects. To the embryologist the various phases of cellular differentiation are of especial interest. The general interest in the study of these tumors has been stimulated to such a degree that today a positive diagnosis and a more favorable prognosis are more likely in the majority of cases.

Treatment of Pelvic Endometriosis.—During the last ten years Dannreuther operated on 115 women with endometriosis. Of these, 39 were instances of adenomyosis, 10 of adenomyoma, 63 of "chocolate" ovarian cyst and widespread endometriosis, and 3 of endometrioma. A number of additional patients were seen in whom a tentative diagnosis of endometriosis seemed warranted but whose discomfort was not intolerable. Progesterone has apparently helped to keep some of these young women comfortable. Others presented clinical evidence of the disease during operation but pathologic study of the excised tissue failed to verify the diagnosis. The author states that it is most important to defer the actual pelvic operation until the pelvic organs have been freed from all omental and intestinal adhesions and normal anatomic relationships have been restored. Manipulations to mobilize pelvic viscera should be started in the deepest possible recesses of the culdesac and continued upward. Dissecting maneuvers begun at the top of the agglutinated area result in shredding of tissue, extensive bleeding and general difficulties. When a huge tumor is impacted in the true pelvis, a longitudinal incision on the anterior aspect of the body of the uterus facilitates removal by enucleation or morcellation. This permits a lateral collapse of the myometrium and allows access to the ovarian and uterine vessels. If the mass is intraligamentary, it can be partly or completely mobilized by making a parallel incision just below the course of the round ligament and detaching the parametrium with the fingers. Chocolate cysts are often extremely thin walled and inadvertently ruptured. Prompt use of suction enables the operator to dispose of the contents of the cyst and to clear the operative field. If the uterovesical fold of peritoneum and the bladder wall are densely infiltrated it is wiser to leave some of the uterus attached to the bladder than to jeopardize the wall of the bladder by overenthusiastic separation. This is true when the lower uterine segment and rectum are extensively involved. In conservative ovarian procedures in young women, especially after ovarian resection, it is best to shorten the utero-ovarian ligament, thus elevating the remaining tissue out of the pelvis and maintaining its position close to the uterine cornu. In some cases areas may remain which cannot be peritonized. Under such circumstances one or two sheets of gutta-percha tissue may be used to wall off the intestinal coils and omentum from the pelvis. For persistent oozing from some raw surface a gutta-percha cigaret drain with a long iodoform gauze end is of value. Attempts to clamp and ligate all small bleeding points are futile.

All the drains are brought out of the lower angle of the abdominal wound and removed after forty-eight hours. They are evidently of service in preventing subsequent intestinal obstruction. Intrauterine radium therapy may be effective in the treatment of adenomyosis, but the value of roentgen therapy for adenomyoma and chocolate cysts is questionable.

American Journal of Ophthalmology, St. Louis 24:247-364 (March) 1941

- Spherophakia with Glaucoma and Brachydactyly. S. J. Meyer and T. Holstein, Chicago.—p. 247.
Accidental Involvement of Eyes in Vaccinia. A. O. Pfingst, Louisville, Ky.—p. 257.
Protein Content of Reformed Aqueous Humor in Man. P. C. Kronfeld, Chicago; C. K. Lin and T. H. Luo, Peking, China.—p. 264.
Function and Structure of Eye. E. Jackson, Denver.—p. 277.
Clinical Studies Concerning Alleged Synergistic Role of Benzedrine and Paredrine in Homatropine Cycloplegia. W. F. Moncrieff and K. J. Scheribel, Chicago.—p. 282.
Illumination Standardization of Snellen Chart. H. G. Martin, Milwaukee.—p. 287.
*Local Use of Sulfanilamide Compounds in Eye. J. S. Guyton, Baltimore.—p. 292.
Modification of Hotz Operation for Entropion Due to Trachoma. J. S. Maxwell, Fairmont, W. Va.—p. 298.
Extravascular Visual Acuity as Measured with Snellen Test Letters. E. Ludvig, Boston.—p. 303.
*Droughts as Factors in Development of Senile Cataract. P. W. Salit, Iowa City.—p. 310.
Local Treatment of Gonorrheal Conjunctivitis with Sulfanilamide Powder. P. Panneton, Montreal, Canada.—p. 314.

Local Use of Sulfanilamide Compounds in Eye.—Guyton treated 18 patients with bilateral catarrhal conjunctivitis with a 5 per cent sulfanilamide ointment in one eye and a control ointment (without sulfanilamide) in the other eye. The ointments were instilled into the conjunctival sacs of the two eyes every hour while the patient was awake. In 4 of 10 patients with bilateral staphylococcal conjunctivitis the cultures became negative in the two eyes simultaneously, in 4 the cultures remained positive in both eyes throughout the period of observation and in 2 they became negative in the eye treated with the sulfanilamide ointment before they became negative in the control eye. The cultures of all 6 patients with bilateral Koch-Weeks conjunctivitis either became sterile at the same time in the two eyes or remained positive throughout the period of observation in both eyes. The cultures of 1 patient with alpha streptococcal conjunctivitis and 1 with pneumococcal conjunctivitis became sterile in the two eyes at the same time. From these results no practical value can be ascribed to the use of sulfanilamide ointment locally for catarrhal conjunctivitis due to the organisms mentioned. The 5 per cent sulfanilamide ointment was used in treating 5 patients with trachoma for periods ranging from two to forty-two days; 3 patients were not benefited and in the other 2 there was definite improvement but not an absolute cure. The 2 latter patients used the ointment for forty-two days. The omission of treatment at night must have adversely affected the local value of the drug, but still there is little evidence that sulfanilamide ointment is of any practical value in trachoma. In 1 patient with gonococcal conjunctivitis no beneficial effect was observed after hourly instillations of sulfanilamide ointment for twenty-four hours. Every case of infected corneal ulcer treated with sulfanilamide ointment healed quite promptly. The patients were treated with the 5 per cent sulfanilamide ointment every hour day and night. Seven staphylococcal ulcers, all of which were more or less severe and 3 of which were hypopyon ulcers, were completely healed in from one to twelve days, 1 Koch-Weeks ulcer with hypopyon healed completely in twelve days and 2 severe ulcers of undetermined etiology healed in one and three days, respectively. Two staphylococcal ulcers, 1 with hypopyon, were treated with 5 per cent sulfapyridine ointment and healed in six and eleven days, respectively.

Droughts as Factors in Senile Cataract.—According to Salit, sudden increases in the incidence of cataract were noticed at the eye clinic of the State University of Iowa immediately following the statewide droughts of 1913-1914, 1921-1922-1923, 1930-1931, 1935 and 1937. In all, 1,863 adult patients with cataracts had been seen during this time. Of these, 1,152 were men and 711 women. It is concluded that some of the agencies responsible for senile cataract consist in such factors as prolonged exposure to intense sunlight, dust, winds and extreme

changes in temperature and humidity of the open spaces. The female clientele was represented chiefly by women who were engaged in ordinary housework. Most of the men worked under conditions in which they often received more or less severe blows on the face or the head, were exposed to radiant energy, heat and various gases from furnaces and acetylene torches as well as intense sunlight, dust, wind and the extreme changes in temperature and humidity of the open spaces or the poisonous carbon monoxide gas of garages and machine shops.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.
45:321-480 (March) 1941

- Myelographic Diagnosis of Intramedullary Spinal Cord Tumors. A. E. Walker, C. M. Jessico and A. W. Marcovich, Chicago.—p. 321.
- Cerebral Hemiatrophy with Compensatory Homolateral Hypertrophy of Skull and Sinuses and Diminution of Cranial Volume. A. T. Ross, Indianapolis.—p. 332.
- Lesions of Lungs in Lymphomatoid Diseases. L. F. Craver, R. R. Braund and H. Y. Tyler, New York.—p. 342.
- Roentgenoscopy as Diagnostic Aid in Coronary Occlusion: Study of 164 Cases. A. M. Master, New York.—p. 350.
- *Roentgenoscopy of Pharynx in Myasthenia Gravis Before and After Prostigmine Injection. R. S. Schwab and H. R. Viets, Boston.—p. 357.
- Roentgen Findings in Exploration of Bile Ducts. J. A. Saralegui, Buenos Aires, Argentina, South America.—p. 360.
- Aneurysm of Left Ventricle: Report of Two Cases. J. J. Peters, Tuskegee, Ala.—p. 371.
- Pericapsular Ossification of Shoulder: Report of Case. H. W. Grimm, Pittsburgh.—p. 379.
- Carcinoma of Head of Pancreas: Report of Case. J. M. Flynn, Rochester, N. Y.—p. 380.
- Radiation Therapy in Cancer of Skin. B. P. Widmann, Philadelphia.—p. 382.
- Clinical Classification of Cancer of Cervix. H. E. Schmitz and P. A. Nelson, Chicago.—p. 395.
- *Treatment of Carcinoma of Ovary: Improvement of Results with Postoperative Radiotherapy. R. I. Walter, A. L. Bachman and W. Harris, New York.—p. 403.
- Relief of Symptoms in Raynaud's Disease by Roentgen Therapy: Report of Case. A. S. Rothberg, New York.—p. 412.
- Effect of High Voltage Roentgen Rays on Heart of Adult Rats. J. E. Leach and K. Sugiura, New York.—p. 414.
- Relation of Sex Hormones to Tumors of Female Reproductive System. R. R. Greene and J. I. Brewer, Chicago.—p. 426.
- Pharmacology of Human Blood After Its Exposure to Roentgen Rays. D. I. Macht, Baltimore.—p. 446.

Roentgenoscopy of Pharynx in Myasthenia Gravis.—Since dysphagia occurs in about 60 per cent of patients with myasthenia gravis and since it is the third most common symptom, it seemed important to Schwab and Viets to recognize dysphagia when it first occurs and to estimate how severely the pharyngeal muscles are involved. The authors took advantage of the fact that the pharyngeal muscles are affected in myasthenia gravis by prostigmine, to demonstrate the response to the drug in 19 patients by roentgen visualization of the pharyngeal cavity during barium sulfate ingestion. A group of patients with other forms of dysphagia were similarly studied. Of the 19 patients so examined, 17 responded so strikingly to prostigmine by injection that practically no barium sulfate was retained in the pharynx. These same patients had also done well with prostigmine treatment by mouth. The technic of roentgenoscopic examination is described. In a severe case, before the intramuscular injection of prostigmine, the thin barium will be retained in the pharynx in such a manner as to be obvious on the roentgenogram. Fifteen minutes after injection, only in cases of myasthenia gravis, the barium passes through the pharynx in a normal manner. The degree of improvement in swallowing, as demonstrated by this method, is an excellent adjunct to the "prostigmine test."

Treatment of Carcinoma of Ovary.—Walter and his associates review the literature on the postoperative radiation therapy of ovarian carcinoma and present 124 additional cases treated by surgery alone or by surgery and postoperative radiation. They believe that failure to classify the cases according to stage of progression has made evaluation of the early results of therapy difficult. The classification they employ groups the cases into four stages: (1) a primary unilateral and completely removable tumor with no visible metastases, (2) the presence of local metastases which are completely removable with the primary tumor, (3) the presence of local metastases which are only partially removable with the primary tumor and (4) cases with advanced carcinomatosis peritonei for which exploratory celiotomy or removal of large tumor masses are diagnostic and

palliative measures. In stage 1 and 2 cases reported in the literature the supplementary use of radiation therapy did not significantly alter the five year survival rate, but the increased number of five year survivals of stage 3 cases in the irradiated group appears to be of statistical significance. The prognosis in stage 4 universally is extremely grave. In the authors' 124 cases the primary operative mortality was 9.8 per cent. Sixty-three patients with ovarian carcinoma were treated by surgery alone. Of these 4, or 6.3 per cent, survived five years. Of the 61 treated by surgery and postoperative radiation therapy 31 received moderately large (adequate) amounts of radiation and 7 were alive five years; 20 received "inadequate" radiation dosage and 2 survived five years, and of 10 given indeterminate roentgen therapy 3 survived five years. The major guide in prognosis and type of therapy to be employed is the clinical stage of the disease. Morphologic classification and microscopic grading appear to be of minor importance. Maximal radiation therapy should be employed whenever possible. There is no unanimity at present as to what constitutes adequate dosage. The authors believe that a dose closely approximating normal tissue tolerance should be delivered during one course of treatment. They employed the following physical factors: from 180 to 200 kilovolts, from 0.5 to 2 mm. of copper or equivalent filtration and from 50 to 80 cm. target skin distance. Two anterior pelvic, two gluteal and two ischial ports were generally used. Two hundred roentgens (in air without backscatter) is usually given to each of two fields daily, and the ports are treated in rotation. The average near tolerance dose is from 2,000 to 2,500 roentgens per field when treated for from one to one and a half months. The treatment should be individualized. Since the effectiveness of roentgen therapy depends in great measure on the dosage administered, it would appear advisable, at least theoretically, to allow the normal uterus to remain in order to permit the use of intrauterine radium therapy. The results reported from this therapy are encouraging. Preoperative radiation therapy in proved stage 4 cases is advocated.

Archives of Dermatology and Syphilology, Chicago
43:607-762 (April) 1941

- Urticaria Solaris: Review of Literature and Report of Case. H. L. Arnold Jr., Honolulu, Territory of Hawaii.—p. 607.
- *Clinical Response of Certain Dermatologic Diseases to Sulfathiazole. L. G. Beinhauer, A. F. Knoll and S. R. Perrin, Pittsburgh.—p. 621.
- Lichen Planus et Acuminatus Atrophicus (Feldman): Folliculitis Decalyans et Lichen Spinulosus (Little). F. A. Ellis, Baltimore, and H. Kirby-Smith, Washington, D. C.—p. 628.
- Late or Delayed Reactions to Patch Tests. G. V. Kulchar, San Francisco.—p. 636.
- Role of Evolution in Dermatology. C. Lerner, New York.—p. 641.
- Tattoo Type Blemishes Following Use of Iron Salts in Treatment of Rhus Dermatitis. R. S. Weiss, A. H. Conrad and A. H. Conrad Jr., St. Louis.—p. 650.
- Familial Benign Chronic Bullous Dermatitis. A. G. Franks and E. F. Traub, New York.—p. 657.
- Postherpetic Scars. E. A. Strakosch and L. M. Nelson, Minneapolis.—p. 664.
- Fixed Eruptions from Various Drugs and Other Agents: Polyvalent Specific Sensitivity. E. W. Abramowitz, New York.—p. 672.
- Norwegian Scabies. S. E. Sweitzer and L. H. Winer, Minneapolis.—p. 678.
- Ascorbic Acid and Arspenamine Dermatitis: Experimental Study. F. M. McDonald, Akron, Ohio, and H. H. Johnson, Cleveland.—p. 682.
- Dermatitis of Hands Caused by Liquid Petrolatum in Proprietary Hair Tonic: Report of Case. H. D. Niles, New York.—p. 689.
- Fixed Eruptions: Report of Unusual Condition Due to Sulfanilamide. M. H. Goodman, Baltimore, and R. D. Arthur, Springfield, Ohio.—p. 692.
- Dermatitis from Indirect Exposure to Fur Dye: Report of Case. H. D. Niles, New York.—p. 698.

Sulfathiazole and Dermatologic Diseases.—Beinhauer and his co-workers used sulfathiazole in the treatment of 103 patients with infectious eczematoid dermatitis, acne vulgaris, furunculosis, contagious impetigo, lupus erythematosus, barbers' sycosis, secondary pyogenic infection or lymphangitis complicating dermatophytosis. Other forms of treatment had failed to cure 58 of these patients. The dosage consisted of 0.5 Gm. tablets four times daily; it was modified for children according to age. The authors' experience with sulfathiazole paralleled that of investigators who have used other sulfanilamide compounds. They found sulfathiazole to be efficacious for the treatment of the conditions listed. The response of the pustular type of acne vulgaris was most dramatic. A pronounced involution

was observed within seven to fourteen days, and complete resolution was then obtained after eight weekly roentgen treatments (75 roentgens of unfiltered roentgen rays). The patients have remained free from the disease for the three months of post-treatment observation. The results warrant further study of a larger series. The response of discoid lupus erythematosus was encouraging but not as pronounced as reported from sulfanilamide therapy. Sulfathiazole therapy failed in the treatment of pemphigus, pemphigus erythematosus (Senear-Usher), dermatitis herpetiformis, herpes zoster and lichen planus. Sulfathiazole appears to be less toxic than other sulfanilamide compounds, decidedly less than sulfapyridine, and probably is better suited for the ambulatory patient. The best results were obtained in cases in which pyogenic infection played an etiologic role. Recognized dermatologic therapy for relatively benign conditions is not to be discarded in favor of sulfathiazole. It is offered as another therapeutic approach especially when other recognized measures fail or as a substitution therapy in selected cases.

Archives of Otolaryngology, Chicago

33:509-682 (April) 1941

- Postoperative Sinus Thrombosis. H. Brunner, Chicago.—p. 509.
Laryngofissure for Cancer of Larynx: Observations Based on Series of Fifty Consecutive Cases. C. L. Jackson, Philadelphia.—p. 520.
Nasal Obstruction and Impairment of Hearing: Report of Forty-Six Cases of Submucous Resection with Audiometric Studies. M. R. Johnson, Red Wing, Minn.—p. 536.
Roentgen Ray Therapy for Patients with Chronic Sinusitis. N. A. Youngs, Grand Forks, N. D.—p. 550.
Technic for Reproduction of Anatomic and Pathologic Models in Latex Rubber: Improved Method. S. Peluse, Los Angeles.—p. 560.
Rhythmic Stimulation of Labyrinth. E. A. Spiegel, Philadelphia.—p. 572.
Mechanism and Treatment of Neurotic Symptoms Especially of Ear, Nose and Throat. S. H. Kraines, Chicago.—p. 579.
Symptoms of Gastrointestinal Origin in Ear, Nose and Throat. W. L. Gatewood, New York.—p. 592.
Sodium Morrhuate Therapy for Chronic Simple, Vasomotor and Hypertrophic Forms of Rhinitis. E. A. Thacker and G. H. Hauser, New Orleans.—p. 600.
The Nasopharynx. S. J. Crowe, Baltimore.—p. 618.
Spreading of Vaccine in Nasal Vaccination. E. Weiss, Chicago.—p. 623.
Reactions of Laryngeal Tissues Following Extended Fractional Roentgen Irradiation. G. R. Brighton, F. Altmann and C. Hagan Jr., New York.—p. 631.

Archives of Surgery, Chicago

42:643-800 (April) 1941

- *Changes in Liver Associated with Hyperthyroidism, with Study of Plasma Prothrombin Levels in Immediate Postoperative Period. J. W. Lord Jr. and W. D. Andrus, New York.—p. 643.
Pulmonary Embolism: Experimental Study of Variations in Volume Blood Flow in Inferior Vena Cava of Dog. W. J. Potts, Oak Park, Ill., and S. Smith, Chicago.—p. 661.
*Macroscopically Nonpathologic Gallbladder: Clinicopathologic Study. P. C. Doehring, Rochester, Minn.—p. 665.
Experiences with Intramedullary Tractotomy: I. Relief of Facial Pain and Summary of Operative Results. F. C. Grant and L. M. Weinberger, Philadelphia.—p. 681.
Functions of Extrahepatic Bile Ducts and Secretory Function of Liver: Parts IV and V. T. Murakami and H. Uchiyama, Fukuoka, Japan.—p. 693.
Anomaly of Right Inferior Laryngeal Nerve. J. deJ. Pemberton and J. M. Miller, Rochester, Minn.—p. 712.
Progressive Bacterial Synergistic Gangrene: Involvement of Abdominal Wall; Report of Unusual Case. M. E. Lichtenstein, Chicago.—p. 719.
Treatment of Tuberculosis of Shoulder: Study of End Results. J. D. Wassersug, Middleboro, Mass.—p. 730.
Relation of Scalenus Anticus Muscle to Pain in Shoulder: Diagnostic and Therapeutic Value of Procaine Infiltration. L. Kaplan, Philadelphia.—p. 739.
Papilloma of Choroid Plexus. R. Y. Herren, Portland, Ore.—p. 758.
Primary Torsion and Infarction of Appendices Epiploicae. B. Pines, J. Rabinovitch and S. B. Biller, Brooklyn.—p. 775.
Rapid Tissue Diagnosis: Comparison of Microscopic Diagnoses Obtained from Terry's Razor Sections and from Paraffin Sections in 4,326 Biopsies. C. A. Hellwig, Wichita, Kan.—p. 788.
Spinal Anesthesia and Surgical Shock. H. Koster, A. Shapiro and A. Goldberg, Brooklyn.—p. 795.

Changes in Liver in Hyperthyroidism.—During the last eight years 680 patients with hyperthyroidism have been subjected to some form of operation on the thyroid at the New York Hospital; 16 of these patients died, 8 in typical thyroid crisis. Lord and Andrus discuss pathologic changes in the liver of 6 patients on whom necropsies were performed. The changes resembled those described by Beaver and Pemberton. The weight of each liver was within normal. Grossly, the picture varied from that of a liver of normal color and con-

sistency to that of a fine nodular cirrhosis with increased consistency. Moderate to decidedly yellow mottling was exhibited by all livers. Microscopically the three main observations were (1) large droplets of fat diffusely distributed in the parenchymatous cells, (2) central necrosis of the hepatic cords with marked infiltration of the necrotic areas by polymorphonuclears and erythrocytes and (3) connective tissue proliferation in the portal spaces with an accumulation of lymphocytes. The levels of plasma prothrombin as an estimation of hepatic function were determined in 36 patients with toxic diffuse and toxic nodular goiter. No deaths occurred during the period of study. As controls the authors followed 10 patients with nontoxic goiter, 10 who had undergone hernioplasties, 9 who had been subjected to major abdominal operations but whose livers had not been handled mechanically and 5 patients who had undergone cerebral operations. Data from the study show that the level of plasma prothrombin in preoperative hyperthyroidism has no direct correlation with the severity of the hyperthyroidism, the duration of the illness or the age or sex of the patient. Likewise the type of goiter bore no relation to the level of plasma prothrombin. However, postoperatively a significant fall occurred in 29 of the 36 patients with toxic goiter. The fall was closely correlated with the severity of the postoperative course as evidenced by temperature, pulse rate and clinical appearance. The level of plasma prothrombin of 6 patients fell to 50 per cent or lower. Although there was no significant fall in the postoperative level of plasma prothrombin in the 10 instances of nontoxic goiter, the slightly reduced preoperative level rose toward normal postoperatively. In contrast, the curve for toxic goiter showed slight improvement on preoperative therapy, and after operation a precipitate fall occurred in twenty-four hours with a subsequent return toward the normal level at the end of seven days. No postoperative fall occurred in the patients who underwent major abdominal or cerebral operations. Fever alone cannot explain the fall, as the 5 patients undergoing cerebral surgery had prolonged fevers. Nine of the 10 patients on whom hernioplasties were performed showed no postoperative fall in the level of plasma prothrombin. In the tenth patient, who showed a moderate degree of shock during operation, the level of plasma prothrombin two hours after the operation was 50 per cent, but in twenty-four hours this had risen to 90 per cent and in forty-eight hours to 100 per cent. A study of seven of the more severe postoperative reactions in hyperthyroidism reveals that the fall occurred concomitantly with the rise in the pulse rate and temperature, but that full recovery of hepatic function lagged behind the return of the temperature and pulse rate to normal. The authors discuss the influence of the carbohydrate-fat ratio of the diet and of the vitamin B complex on the liver and suggest that in the preoperative preparation of patients with hyperthyroidism a high caloric, high carbohydrate, high protein, low fat diet supplemented with liberal amounts of vitamin B complex should be employed.

Macroscopically Nonpathologic Gallbladder.—Doehring reports a clinicopathologic study of macroscopically normal gallbladders removed because of the diagnosis of cholecystitis. Although individual results are unpredictable, it has been found that removal of such a gallbladder results in relief of symptoms in only a slightly smaller percentage of cases than in those containing stones and in acalculous cholecystitis. Of the 1,981 patients operated on at the Mayo Clinic during the years 1931 to 1933 the gallbladders of 81.9 per cent contained stones. A postoperative follow-up interval of at least five years was believed sufficient for discounting the benefits obtained from prolonged rest in bed, supervised convalescence and a nutritious diet. The remaining 114 gallbladders (5.75 per cent) were normal. These gallbladders, with the exception of 10 not included because of coexisting abdominal pathologic conditions, form the basis of this report. The histories, symptoms, operative observations and pathologic change were correlated. The results were determined through correspondence. The macroscopically nonpathologic gallbladders were found at operation even in the presence of a typical history of disease of the gallbladder with biliary colic, jaundice and tenderness in the right upper abdominal quadrant. Half of the patients with apparently normal gallbladders gave a history typical of disease of the

gallbladder, one third had typical biliary colic and one third gave a history of jaundice. Half of the patients showed evidence of nervous exhaustion or neurotic tendencies. Almost 90 per cent of the cholecystograms showed normally functioning gallbladders. There was no constant relation of the operative observations to any of the preoperative ones. No evidence was found to support the view that hepatitis as described at the time of operation had any significant relation to the preoperative observations or to the prognosis. Microscopically, all specimens showed varying degrees of lymphocytic infiltration, although there was no relation between the degree of infiltration and the preoperative signs, the operative observations or the prognosis. The results of cholecystectomy were similar to those obtained by others in similar cases. The good results were fewer than in those cases in which definite pathologic lesions or stones were present. Fifty-five per cent of the patients were cured, 21 per cent were improved and 23 per cent obtained no relief. The operative mortality was 1 per cent. There is no way of foretelling before or at operation which patients with macroscopically normal gallbladders will be relieved of their symptoms after cholecystectomy. Approximately 1 of 4 such patients received no benefit from operation. The good results were slightly higher among patients with a history of colic and a clinical picture more or less typical of disease of the biliary tract.

Bulletin of Johns Hopkins Hospital, Baltimore 68:203-290 (March) 1941

- "Personality Disorders" Causing Digestive Complaints. G. C. Roberson, Baltimore.—p. 203.
Influence of Estrin on Callous Formation. R. G. Hills and J. A. Weinberg, Baltimore.—p. 238.
Experimental Studies on Intraneural Spread of Poliomyelitis Virus. D. Bodian and H. A. Howe, Baltimore.—p. 248.
Duration of Infectivity of *Treponema Pallidum* in Citrated Blood Stored Under Conditions Obtaining in Blood Banks. T. B. Turner and T. H. Discker, Baltimore.—p. 269.

Canadian Medical Association Journal, Montreal 44:217-326 (March) 1941

- Clinical Use of Sulfanilamide, Sulfapyridine, Sulfathiazole, Sulfaguanidine and Sulfadiazine in Prophylaxis and Treatment of Infections. P. H. Long, Baltimore.—p. 217.
Some Aspects of Aviation Medicine. R. W. Ryan and G. E. Hall, Ottawa.—p. 227.
*Source and Prevention of Septic Infection of Wounds. R. Hare and Reba E. Willits, Toronto.—p. 230.
Sulfathiazole Therapy of Gonorrhea. C. H. Greig, J. L. Uren and D. R. Mitchell, Toronto.—p. 237.
Sodium Sulfathiazole in Urology. D. R. Mitchell and F. H. Côté, Toronto.—p. 240.
The Physician's Interest in Gallbladder Disease. A. H. Gordon, Montreal.—p. 245.
Diabetes Mellitus: Problems of Its Control. Lillian A. Chase, Regina, Sask.—p. 250.
Periodic Fluctuations in Blood Picture in Cancer and Their Bearing on Radiation Therapy. O. C. Gruner, Montreal.—p. 256.
Significance of Gallop Rhythm. F. C. Hamilton, Toronto.—p. 260.
Differential Diagnosis of Urologic Conditions from Abdominal Lesions. S. A. Wallace, Kamloops, B. C.—p. 265.
Technic in Establishing Diagnosis of Genitourinary Malformation. C. E. Snelling, Toronto.—p. 269.
Treatment of Pneumonia in Childhood. R. R. Struthers, Montreal.—p. 271.
Few Common Problems in Infancy. P. E. Williams, Hamilton, Ont.—p. 275.
Caesarean Section. D. M. Low, Toronto.—p. 280.
Prevention and Treatment of Laceration. J. A. MacMillan, Montreal.—p. 284.
Meningitis of Newborn Due to *Pseudomonas Aeruginosa*. A. E. Allin, Fort William, Ont.—p. 288.

Source and Prevention of Septic Infection of Wounds.—Hare and Willits studied cases in emergency departments with the view of determining the source of the hemolytic streptococcus responsible for wound infection and its possible prevention. The study indicates that at the time of infliction the wound is probably not infected, for the air, the projectile, the soil and the dust, the clothing and the skin of normal persons are normally not significantly infected with these organisms. Of 244 wounds examined soon after infliction, only 1 was found to have hemolytic streptococci in it and the strain was a member of group H which is usually not pathogenic for man. This wound did not become infected. All wounds must be considered susceptible of infection until actually healed. Eighty of the 244 wounds were reexamined later (as far as

possible forty-eight hours after infliction); 4 were found to harbor hemolytic streptococci (*Streptococcus pyogenes*), 3 were acquired within forty-eight hours, but in the fourth they were absent on the sixth day but present and causing clinical infection on the tenth day. Numerous workers have found that 8.7 per cent of wounds examined from one to three days after infliction had hemolytic streptococci, whereas in from four to twelve days the percentage was 18.5 and after from thirteen to forty days it was 20. Thus *Streptococcus pyogenes* is not present in the majority of wounds at the time of infliction but is of exogenous origin. The exogenous sources are two: (1) the nasopharynx of patients, convalescents and carriers and (2) pyogenic infections. The importance of the throat carrier or contaminated air from suppurating lesions as the source of many varieties of hemolytic streptococcus infection has been demonstrated by many workers. It is highly probable that infection of wounds by *Streptococcus pyogenes* expelled from the nasopharynx of the patient himself, from an attendant or indirectly by their hands are the most important avenues, for during such time casualties are not likely to have any contact with an actively suppurating infection. Once in the hospital the same sources may still be responsible, but another menace is added: suppurating wounds of other patients in the ward. The authors state that the majority of their staphylococcal infections were of exogenous origin. No less than 68 per cent harbored staphylococci, but of 67 strains examined only 13 were found to be *Staphylococcus aureus*. The remainder can be considered as not pathogenic. The clean wounds of 4 patients examined soon after infliction became infected with *Staphylococcus aureus* between the first and succeeding examination. For preventing infection of wounds the obvious method is the wearing of an efficient mask by all who come in contact with the wounded. If the wearing of masks is not feasible the operator must refrain from speaking, coughing or sneezing. For the control of infection by indirect transfer by hands, clothing and the like, it is advisable that the bare hands should at no time come in contact with open tissue without suitable treatment; clean sterilized gloves should be changed for each case, unsterilized gloves washed thoroughly with soap and water and dipped in an antiseptic of adequate strength or the hands should be well washed with soap and water. The latter alone may suffice to cleanse them of hemolytic streptococci, but it is doubtful whether they will be free from *Staphylococcus aureus*. The use of handkerchiefs as an emergency dressing should be forbidden, as those of nasopharyngeal carriers have been shown to be contaminated. The transfer of organisms to a wound from a nasopharyngeal carrier not in direct contact with the patient is by air pollution. Therefore all such patients should be examined bacteriologically and, if necessary, isolated in order to guard against this source of infection. An infected wound may be due to the organisms from a nasopharyngeal infection in a patient preceding another on the operating table. The nasopharynx of the wounded man with a suppurating lesion and his bedclothes, skin and dressings should be looked on as potentially infective for other persons. Nurses can decrease air pollution by carefully folding and placing dressings in a covered receptacle at once and by disturbing the bedclothes as little as possible when making beds. Blankets, sheets, pillow cases and bedspreads should be carefully rolled off and as carefully rolled on again. Dirty sheets and other bedding, with as little shaking or disturbance as possible, should be placed into some suitable receptacle. Sweeping and dusting should be done only after a moist or oily dressing has been applied to keep the dust down.

Journal of Pharmacology & Exper. Therap., Baltimore 71:203-300 (March) 1941. Partial Index

- Effect of Sulfur Compounds in Diet on Sulfanilamide Cyanosis and Anemia. A. P. Richardson, San Francisco.—p. 203.
Toxicity of Naphthoquinones with Vitamin K Activity in Mice. M. B. Shimkin, Bethesda, Md.—p. 210.
Role of Liver in Detoxification of Steroid Hormones and Artificial Estrogens. H. Selye, Montreal.—p. 236.
Reliability of Cobalt-Isopropylamine Color Reaction for Amytal: Evaluation of Chromogenic Substances in Urine. R. F. Krause and R. F. Riley, Rochester, N. Y.—p. 287.

Journal of Urology, Baltimore

45:253-512 (March) 1941. Partial Index

- Treatment of Rupture of Kidney. O. S. Lowsley and J. H. Menning, New York.—p. 253.
- Body Section Pyelograms in Children. N. W. Bourne and H. W. Hefke, Milwaukee.—p. 296.
- Carcinoma of Bladder: Correlation of Pathologic and Clinical Data as Basis for Treatment. E. M. Watson and C. C. Herger, Buffalo.—p. 331.
- Evaluation of Supravoltage Treatment of Bladder Tumors. F. H. Colby, Boston.—p. 337.
- Treatment of Bladder Diverticulum: Report of Thirty Cases. J. C. Kimbrough, Washington, D. C.—p. 368.
- Bladder Control: Brief Review. A. Ecker and T. F. Laurie, Syracuse, N. Y.—p. 397.
- The Male Climacteric: Its Diagnosis and Treatment. R. J. Douglas, Muskegon, Mich.—p. 404.
- Transurethral Prostatic Resection: Statistical Study Based on 300 Consecutive Cases. H. N. Dorman, Washington, D. C.—p. 411.
- Critique of Present Methods in Surgery of Prostate Gland. J. F. McCarthy, New York.—p. 428.
- *Mortality in Surgery of Prostate. S. A. Vest, Charlottesville, Va.—p. 439.
- Galvanic Cautery Transurethral Resection: Report of 290 Cases. E. Kackley, Soda Springs, Idaho.—p. 451.
- Periostitis Pubes Following Suprapubic Cystostomy. W. K. Wheeler, Newark, N. J.—p. 467.
- Diverticulum of Female Urethra. F. J. Parmenter, Buffalo.—p. 479.
- Significance of Low Blood Urea in Presence of Anuria. R. K. Raliff, Ann Arbor, Mich.—p. 501.

Mortality in Surgery of Prostate.—Vest reports a series of 365 consecutive operations for the relief of prostatic obstruction with a mortality rate of 1.6 per cent. The patients were cared for in a public ward service, and their operations and care were the responsibility of residents trained at the Brady Urological Institute. Perineal prostatectomy was performed on 221 patients, suprapubic prostatectomy on 12 and transurethral resection on 132. The majority of the patients were considered poor surgical risks. Of the patients treated by prostatectomy 112, or 48 per cent, were admitted either in a state of acute retention or had been catheterized for acute retention just before admission. Medical complications were present on admission in 140 of the 233 patients. The frequent finding of advanced senility and the 1 instance of arteriosclerosis was omitted from the tabulation of medical complications unless it was unusually severe. Increased blood pressure was common; 48 per cent of the patients had a systolic blood pressure above 150, with an average of 179.5 systolic and 100 diastolic. Urologic complications were present in 108 of the 233 patients; in 60.5 per cent the urine was infected on admission. This high incidence of infected urine was due for the most part to instrumentation. The perineal prostatectomy was carried out according to the technic of Young, as was the postoperative care of the patient. In practically every instance, by the time the wound was healed, the patient was afebrile, walking and about ready to be discharged. The average healing time was twenty-one days. The transurethral methods for the 132 patients included Young's punch, Stern-McCarthy resectoscope, and Braasch's and Thompson's modifications of Young's punch. Medical and urologic complications, retention, renal impairment and infected urine for this group were almost identical with that of the prostatectomy group. Fifteen patients required second resections. The operative mortality for the 233 patients treated by prostatectomy was 1.2 per cent, and for the group treated by transurethral resection 2.2 per cent. An additional 26 patients, admitted during this period with prostatic obstruction at the vesical orifice, died before operation could be carried out. Many were in such a critical state that they would have succumbed whatever the preoperative care; 11 died within five days or less after admission. Fourteen patients died following suprapubic cystostomy. The author believes that perineal prostatectomy, besides being safe and surgically sound, gives excellent functional results with less possibility of a recurrence of obstruction than the resection. Early carcinomas can be recognized and radically treated through the perineum. The perineal route affords dependent drainage to infected bladders and lessens the chance of serious infection of the upper part of the urinary tract. The mortality of 1.6 per cent for 365 public ward patients demonstrates that a low mortality can be obtained with proper care in patients who enter the hospital in poor condition and with many complications.

Kansas Medical Society Journal, Topeka

42:89-132 (March) 1941

- Treatment of Chronic Indigestion. W. L. Palmer, Chicago.—p. 89.
- Management of Congestive Heart Failure. T. J. Dry, Rochester, Minn.—p. 92.
- Principles Necessary in Successful Management of Colon Cancer. K. E. Voldeng, Wellington.—p. 97.
- Radiation of Leukemia. A. A. Sprong, Sterling.—p. 102.
- Eucupin Infiltrations in Abdominal Surgery. H. L. Collins, Deloit.—p. 106.
- Gauze Sponge in Abdomen Twenty-Seven Years. M. A. Walker and C. E. Coburn, Kansas City.—p. 107.

Medical Annals of District of Columbia, Washington

10:79-120 (March) 1941

- *Role of Effort, Trauma, Work and Occupation in the Onset and Subsequent Course of Coronary Artery Occlusion. A. M. Master, S. Dack and H. L. Jaffe, New York.—p. 79.
- The Patient Has a Stroke. W. Freeman, Washington.—p. 87.
- Unusual Reaction to Bee Sting: Report of Case. D. Noble, Rockville, Md., and C. R. L. Halley, Washington.—p. 93.
- Rat-Bite Fever in Washington, D. C.: Report of First Proved Case. A. Packchianian and L. K. Sweet, Washington.—p. 95.
- Clinicopathologic Conference: George Washington University School of Medicine. R. M. Choisser and W. A. Bloedorn, Washington.—p. 98.

Activity, Onset and Course of Coronary Thrombosis.

—Master and his colleagues present a composite picture of coronary thrombosis based on a study of 1,700 proved attacks. The events associated with the onset of 1,108 attacks show that 52 per cent occurred while the patient was asleep or resting, 21 per cent during mild routine activity, 16 per cent while walking, and 9 per cent during moderate activity (ironing, painting, baking and the like). Only 2 per cent of the patients gave a history of unusual physical exertion. At least 75 had been bedridden for considerable periods prior to the occlusion. In 25 of these intimal hemorrhage was just as frequent as in the entire postmortem material. Pain may be related to effort but this must not be confused with the actual attack of coronary occlusion with its premonitory symptoms. The occupation of 1,286 patients was known, and it was found that coronary occlusion occurred with equal frequency among all occupational groups; 35.5 per cent were manual workers, 19.5 per cent housewives, 11 per cent business men, 10 per cent retired, 9.5 per cent white collar and office workers, 9 per cent professional persons and 5.5 per cent store workers. Comparison of this occupational distribution was found to be almost identical with that of the general population of New York City. This close correspondence eliminates occupation as a precipitating factor. From a study of the literature and from their own experience the authors concluded that there was no definite evidence that trauma produced classic coronary occlusion. However, direct and indirect trauma does result in disturbing and contusing the heart. This problem requires further critical investigation. Too often doubtful cases are accepted as proved. Also the effect of experimental trauma on the heart is quoted in respect to coronary occlusion without appreciation of the fact that contusion of the heart, and not coronary occlusion, is produced. The patient's return to work and the subsequent course of coronary occlusion was determined by follow-up data on 422 private and ward patients from all strata of society. They were observed for from six months to fifteen years; 20 per cent were followed five or more years. Of these, 53 per cent returned to work after recovery from the attack; 92 per cent did so within from three months to one year. The percentage of those returning to work was greater among private than among ward patients. Return to work is closely correlated with age; the younger the patient, the more likely is his return. Another significant influence was the presence of previous attacks; 59 per cent of those in their first attack resumed work, whereas only 38 per cent of those in their second attack and 23 per cent of those in their third attack did so. Only half of the laborers resumed their occupation as compared to two thirds of the white collar and office workers and four fifths of the professional persons. The majority of the latter worked full time, whereas half of the workers did only part time work. Many of those who did return to work complained of weakness, precordial pain and dyspnea. This was true of about half of the group, particularly the laborers, white collar workers and

housewives. The symptoms were not severe enough to preclude work and many of them had similar symptoms before the attack. Most of the patients who did not return to work gave as their reason angina pectoris, dyspnea or weakness, and examination disclosed that some degree of heart failure was common. The authors believe that a considerable proportion of them could have resumed work had it been necessary, that is if they had not had disability insurance. Subsequent attacks, the mortality rate and the incidence of heart failure were not greater among those who returned to work than in those who did not. It is apparent that ordinary work following recovery does not predispose to further attacks of coronary occlusion or heart failure.

Oklahoma State Medical Assn. Jour., Oklahoma City 34:93-138 (March) 1941

- Skin Manifestations in Diabetes Mellitus. J. H. Lamb and B. F. Keltz, Oklahoma City.—p. 93.
The Negro in Proctology. C. Rosser, Dallas, Texas.—p. 97.
Acute Intussusception in Infants: Report of Two Cases. J. H. Walker, Muskogee.—p. 100.
Colloidion as Dressing for Skin Grafting of Granulating Wounds. S. S. Ellis and C. von Wedel, Oklahoma City.—p. 103.
Some Safety Factors in Obstetrics. L. C. Northrup, Tulsa.—p. 106.
Management of a Maternity Service with Nurse Attendance at Delivery in a Rural Area: Preliminary Report. I. Dyer, Tahlequah.—p. 108.

Surgery, St. Louis

9:331-492 (March) 1941

- *Chronic Abdominal Pain Due to Hypoglycemia: Note on Pathogenesis of Neurotic Symptomatology. B. P. Sandler, New York.—p. 331.
*Acute Appendicitis in a Suburban Community. J. A. McCreery, New York, and H. P. Serrell, Greenwich, Conn.—p. 349.
Liver Injuries: Case Report of Repeated Hemorrhages Through Biliary Ducts. H. R. Hawthorne, W. W. Oaks and P. H. Neese, Philadelphia.—p. 358.
*Oral Administration of Synthetic Vitamin K (2-Methyl-1, 4-Naphthoquinone). E. R. Anderson, J. E. Karabin, H. L. Udesky and L. Seed, Chicago.—p. 361.
Treatment of External Fistulas of Proximal Small Bowel: Means of Temporary Mechanical Anastomosis. E. A. Macnaughton, Montreal.—p. 372.
Pathologic Study of Hypertrophic Arthritis of Hip. M. H. Sawyer and R. K. Ghormley, Rochester, Minn.—p. 381.
Treatment of Tumors of Shoulder Region by Interscapulothoracic Amputation. J. E. Strode and E. A. Fennel, Honolulu, Hawaii.—p. 394.
Metastases in Skull from Carcinoma of Thyroid: Clinical and Roentgenographic Study of Two Cases with Brief Survey of Literature. O. Turner and W. J. German, New Haven, Conn.—p. 403.
Urinary Stones: Study of Their Etiology in Small Children in Syria. R. K. Brown and Enid Crump Brown, Buffalo.—p. 415.
Disease in the American Negro: I. Melanoma. W. A. D. Anderson, Memphis, Tenn.—p. 425.
Cross Infections from Anesthetic Face Masks. H. Livingstone, F. Heidrick, J. Holicky and G. M. Dack, Chicago.—p. 433.
Observations on Capillary Permeability in Areas of Inflammation Produced by Staphylococci. R. H. Rigdon, Memphis, Tenn.—p. 436.

Chronic Abdominal Pain Due to Hypoglycemia.—Sandler presents histories of 5 patients with long periods of recurrent attacks of abdominal pain due to unrecognized hypoglycemia. All had undergone thorough investigation with the exception of the dextrose tolerance test. Laparotomy was advised as a last resort. Three had appendectomies, 1 cholecystectomy and 1 herniorrhaphy. However, the pain recurred and the patients returned with their original complaints. It was believed that they were neurotic or that they had post-operative adhesions. In addition to the pain there were headache, nervousness, dizziness, sweating, faintness and syncope, symptoms which were not accorded their proper significance. If such symptoms are interpreted as hypoglycemic manifestations the true nature of the syndrome becomes evident. Two women patients had headaches of such frequency and severity as to suggest investigation for cerebral tumor. One of these patients was twice subjected to encephalography. The most successful therapy has been low carbohydrate diet with increased protein and fat. The patient is instructed to take a glass of milk or milk and cream or tomato juice, with a cracker and butter or cheese between meals and at bedtime. Bedtime feeding is especially indicated in nocturnal pain. Relief from pain may be attained after a few days or weeks, because such a diet elevates and stabilizes blood sugar levels. From experimental data it is justifiable to attribute abdominal pain and nervous symptoms in patients with hypoglycemia to the abnormal fall in blood sugar concentration. The pain may be generalized or localized. As long as the patients remained on a low carbohydrate diet they had no pain, but when they returned

to their former high carbohydrate intake pain usually recurred after several days. Dextrose tolerance tests revealed increased tolerance in all. The tests should be done along with roentgen studies in cases of obscure abdominal pain. The symptoms may be aggravated by, or may recur, following psychic trauma, mental upsets and financial and domestic difficulties. Such unpleasant environmental factors can bring about visceral and mental symptoms by deranging the carbohydrate metabolism. The effect of unpleasant physical and psychic experiences on the blood sugar are well illustrated by the 5 cases. These 5, the author states, were selected from a larger series of patients with abdominal pain due to hypoglycemia only because laparotomy had been performed. Chronic hypoglycemia is a common disorder masquerading as pseudocancer, chronic appendicitis, abdominal migraine, abdominal angina, effort syndrome, neuro-circulatory asthenia, larval hyperthyroidism and the like. The fact that most of the patients respond to a low carbohydrate diet suggests that the fundamental cause of the disturbance is the continued ingestion of a high carbohydrate diet which contains 200 or more grams of carbohydrate daily. The diet employed in treatment allows approximately 100 Gm. of carbohydrate daily. This amount may be increased gradually as long as the patient continues to be symptom free.

Acute Appendicitis.—McCreery and Serrell review recent literature on the mortality incidence of acute appendicitis and present a study of the disease as it occurred in Greenwich, Conn., a suburban community with a population of 40,000 whose average intelligence is high and whose "health sense" has twice won the annual health conservation certificate awarded by the United States Chamber of Commerce. From June 1, 1933 to Dec. 31, 1939, 525 patients with acute appendicitis were operated on at the Greenwich Hospital. Of this total 449 patients were in the first four decades of life. Previous attacks were had by 154 of the patients. The present attack was typical in 505, atypical in 16 and unnoticed in 4. The first symptom was pain in 507, nausea and vomiting in 9 and diarrhea in 9. Cathartics were taken by 181 of the patients. There was 1 death among 465 patients operated on within forty-eight hours after an attack. Catharsis had an apparently slight effect on delay in operation and on the extent of appendical involvement. It is the authors' impression that cathartics may be more important as a cause in delaying operation than in the actual local damage that they cause. There were 7 deaths in this series, 1.3 per cent. There were no deaths among 396 patients in whom the disease was limited to the appendix nor among the 37 patients with an abscess. One patient with local peritonitis (pelvic) died, a mortality rate in this group of 1.8 per cent. Of 29 patients having diffuse peritonitis, 6 died (20.6 per cent). Four of the 7 patients who died had been sick less than forty-eight hours. At operation all had gross leakage from ruptured appendixes. *Bacillus coli* was reported in all cultures. Aside from the possible effect of catharsis in 5, vigorous physical therapy may have been a factor in the rupture of one of these appendixes.

Oral Administration of Synthetic Vitamin K.—Anderson and his colleagues gave synthetic vitamin K (2-methyl-1, 4-naphthoquinone) orally to 23 patients with a delayed prothrombin time. The response of 22 was favorable; 1 patient, in a moribund condition as the result of rectal carcinoma, had only a 5 per cent increase in clotting activity. The initial dose of the synthetic compound recommended is 6 mg. with 2 Gm. of bile salts (six capsules of 5 grains [0.32 Gm.] each). The plasma prothrombin level was then maintained with from 3 to 6 mg. of vitamin K and 2 Gm. of bile salts daily. A pronounced response to the synthetic vitamin K almost invariably occurs within one half to one hour. The amount of vitamin K necessary to maintain a normal clotting time varies. Prothrombin determinations are necessary for determining maintenance dosage. Following surgical intervention on the biliary tract the fourth to the seventh postoperative day was the period when the prothrombin activity most frequently reached dangerously low levels. Hypoprothrombinemia may occur with or without jaundice and with or without bleeding. However, it is encountered more frequently in jaundiced patients, particularly if considerable hepatic damage is present.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

53:97-126 (April) 1941

Syndrome of Ehlers-Danlos. H. S. Barber, J. Fiddes and T. H. C. Benians.—p. 97.

Cutaneous Bridges and Fibromatoid Formations in Experiments on Animals. M. Friedmann.—p. 113.

British Journal of Ophthalmology, London

25:141-188 (April) 1941

Measurement of Heterophoria. N. Cridland.—p. 141.

Angiomatosis Retinae: Report of Four Cases in One Family Involving Six Eyes. L. Staz.—p. 167.

Edinburgh Medical Journal

48:145-216 (March) 1941

Observations on Classification of Gliomas. H. Russell.—p. 145.

*Circulatory Collapse and Wound Shock. J. McMichael.—p. 160.

Inspection. F. E. Jardine.—p. 173.

A Student of 1765-1770—A Glimpse of Eighteenth Century Medicine. D. M. Lyon.—p. 185.

48:217-288 (April) 1941

Nutritional Factors in Dark Adaptation. C. P. Stewart.—p. 217.

Physiologic Approach to Medical Problems. R. J. S. McDowall.—p. 238.

Studies on Stored Blood: VI. Changes in Erythrocytes During Storage. A. Crosbie and H. Scarborough.—p. 253.

The Lighter Side of Edinburgh Medical Life at the End of the Nineteenth Century. A. C. Brown.—p. 271.

Circulatory Collapse and Wound Shock.—McMichael states that, owing to the somewhat unexpected course of the war, few studies could be made in cases of shock during the first year. During that time basic studies were made mainly on circulatory collapse from hemorrhage. Recent air raids have broadened the clinical experience, as illustrated by the three types of cases encountered. These cases represent shock due to loss of plasma constituents, shock due to hemorrhage and shock due to the loss of both plasma constituents and blood. From quantitative observations on the circulation the author concludes that trauma leads to loss of blood and transudation of "plasma" in the injured area. As a result, cardiac output is severely depressed, and this results in oxygen deprivation. Oxygen deprivation leads to a further increase in capillary permeability, making treatment difficult, as plasma is not retained. However, in favorable cases the deleterious effect on capillary permeability is reversed if a good circulatory tone can be maintained. For this, early treatment and assiduous and continuous attention are necessary. If the serum transfused is not retained, further transfusion must be given. In a general way a rising pulse rate indicative of circulatory collapse holds true in shock. Racing pulse rates are infrequent, but pulses of from 100 to 120 are common. A slow pulse does not exclude shock. The fall in pulse rate may not be significant when blood pressure is restored. It is often rapid for a day or two after a satisfactory blood pressure has been attained. An increased permeability of capillaries may be indicated by a rise in plasma proteins and a leakage of albumin from the blood. Rising blood urea is encountered in shock, but it is not as high as in hematemesis. A rising serum potassium and falling sodium and chloride appear only after a prolonged low blood pressure. In many instances they are antemortem changes. The distribution of inorganic ions is normally sodium and chloride extracellularly and potassium and phosphate intracellularly. As death approaches, it appears that this important differential cell-membrane permeability is lost, with a rise in serum potassium and a fall in sodium. Early treatment of shock should prevent these changes. The "toxemic" phase of burns has been seen in cases of traumatic edema from extensive crushing. Wilson suggested that the transuded fluid may develop lethal properties. The author's experience suggests that these biochemical changes result from profound renal insufficiency which in some way depends on restoration of circulation through dead muscle tissue. Primary shock which resembles a prolonged faint and is not

necessarily associated with severe injury or even with any injury should be differentiated from severe secondary shock. The vasovagal mechanism is probably responsible. It may persist until secondary shock develops and confuses the picture. The diagnosis of shock is best made by blood pressure, pulse records and the clinical state. Of these, blood pressure is all important, as the pulse may be misleading and the clinical state may be simulated by other conditions: primary shock which tends to spontaneous recovery, acute carbon monoxide poisoning, and blast contusion of the lungs in which blood pressure is not lowered unless other injuries causing shock are present. Shocked patients should be treated in a special resuscitation ward. The usual general measures are relief of pain, arrest of hemorrhage, warmth, raising the foot of the bed and the administration of fluid. Some special points are the following: 1. Early and adequate transfusion of blood, plasma or serum should be given until the blood pressure is normal. If the blood pressure falls again further transfusion is indicated. 2. Oxygen may be raised to a concentration of 90 per cent in the alveoli of the lungs by use of the Bulbular, Lovelace and Boothby mask. It should always be used during a delay in giving a transfusion. 3. In severe crushing injuries the danger to the circulation of the limb and the risk of toxemia make it important to limit transudation. Crushed limbs should be bandaged and elevated to achieve this end. Once toxemia has developed, even amputation may not save life. Decapsulation of the kidneys has not yet been tried. It may be that some biochemical index of the severity of the damage to muscle will have to be found and early "prophylactic" amputation resorted to.

Lancet, London

1:303-336 (March 8) 1941

Dissection Lobectomy. R. S. Pileher and Eva Byrd.—p. 303.

Acute Nervous Illness in Active Warfare. W. H. de B. Hubert.—p. 306.

Ammonium Chloride and Ammonium Carbonate in Chronic Bronchitis. S. Alstead.—p. 308.

Preservation of Blood for Sugar Analysis. E. J. King, S. S. Pillai and D. Beall.—p. 310.

Staphylococci Septicemia Treated with Sulfathiazole. J. Heselson.—p. 311.

Vitamins A and D in Dripping. K. M. Henry, S. K. Kon, T. W. Goodwin and R. A. Morton.—p. 311.

Medical Journal of Australia, Sydney

1:345-372 (March 22) 1941

Clinical Impressions of Epidemic of Sandfly Fever in Palestine During 1940. A. S. Walker and L. Dods.—p. 345.

Thyrotrophic and Antithyrotrophic Factors in Some Types of Thyroid Disease. A. R. Robinson.—p. 349.

Investigation into Type Incidence of Pneumococci in Infections of Lower Respiratory Tract. Elizabeth A. Stobo and E. Marjory Little.—p. 356.

Outbreak of Infection Due to Streptococcus Moniliformis Among Wild Mice. S. Williams.—p. 357.

1:373-404 (March 29) 1941

Warfare and Tropical Medicine. J. O. Poynton.—p. 373.

Some Aspects of Two Common Tropical Diseases. P. A. Mapleston.—p. 377.

Tsutsugamushi Fever in North Queensland, Australia. W. G. Heaslip.—p. 380.

Practitioner, London

146:193-288 (April) 1941

Minor Medical Maladies. H. Rolleston.—p. 193.

Chronic Constipation. A. Abrahams.—p. 195.

Minor Disturbances of Digestion. T. L. Hardy.—p. 201.

Influenza (Acute Infectious Respiratory Catarrh). I. J. Davics.—p. 203.

Acute Sore Throat. F. E. S. Willis.—p. 211.

Bronchitis. F. L. Lander.—p. 219.

Pleurisy. J. Maxwell.—p. 223.

Palpitation and Tachycardia. R. Gilchrist.—p. 227.

Obesity. C. N. Armstrong.—p. 233.

Napkin Area Rashes. L. Forman.—p. 238.

Corns, Warts and Boils. F. F. Hellier.—p. 244.

Migraine. H. L. Parker.—p. 249.

Reactive Emotional Disorders. A. T. M. Wilson.—p. 254.

Transient Seizures Involving Disturbance of Consciousness. P. Cloake.—p. 259.

Pink Disease Treated by Intramuscular Vitamin B₁₂: Report of Eight Cases. J. D. Hay.—p. 264.

Modern Therapeutics: XXII. Modern Treatment of Intestinal Parasites. P. Manson-Bahr.—p. 271.

Gazzetta degli Ospedali e delle Cliniche, Milan**61:601-620 (July 28) 1940. Partial Index*****Alcoholization of Intercostal Nerves in Therapy of Fractures of Ribs.** G. Radici.—p. 603.

Alcoholization of Intercostal Nerves.—Radici reports 40 cases of fracture of ribs, with or without pleuropulmonary complications, treated by the Latteri technic. The method consists in roentgenologic identification of the fractured rib or ribs and injection of 0.5 cc. of a 4 per cent solution of procaine hydrochloride followed thirty seconds later by the injection of 2 cc. of 90 per cent alcohol 4 cm. away from the vertebral spinous process, perpendicular to the posterior costal plane of the vertebral spinous process and along the lower margin of the rib up to the costal sulcus. The alcohol is injected slowly. This procedure is repeated for each fractured rib in one treatment, except in the presence of several fractured ribs in old persons. In the elderly, alcoholization is carried out in two or three treatments. In the cases reported local pain caused by respiration was immediately and permanently controlled, and the course of the pleuropulmonary complications, such as emphysema, hemothorax and hemoptysis, was favorably influenced. The author believes that the treatment stimulates normal formation of callus. It is simple and well tolerated. The nerves regenerate within two or three months.

Rivista di Patologia e Clin. d. Tubercolosi, Bologna**15:1-68 (Jan.) 1941. Partial Index****Injections of Sclerosing Substances in Pulmonary Parenchyma in Attempted Treatment of Pulmonary Tuberculosis.** P. Apollonio.—p. 1.***Rupture of Tuberculous Cavities Causing Spontaneous Pneumothorax in Course of Artificial Pneumothorax.** E. Lenci.—p. 20.

Rupture of Tuberculous Cavities.—According to Lenci, rupture of cavities is the most frequent cause of spontaneous pneumothorax in the course of artificial pneumothorax therapy. The author reports 6 cases in which imminent rupture of a cavity was predicted on the basis of peculiar roentgenologic appearance of cavities in the collapsed lung. In 1 case rupture was prevented. Threatening rupture is made evident by the rapid increase in the size of the cavity to one, two or three times the previous size. The cavity appears in the roentgenogram as a clear spherical shadow in the pleural cavity surrounded by a ring of dark homogeneous opacity. The clinical symptoms do not correspond to the aggravation of the pulmonary condition. Suddenly, rupture with consequent spontaneous pneumothorax takes place. If it is not acute, the cavity disappears in the roentgenogram and pleurisy develops. Of the cases reported by the author, 2 were acute. In 3 cases the treatment consisted of immediate removal of intrapleural gas in order to stimulate reexpansion of the lung. The patients were put on complete rest. Drugs to alleviate cough, as well as ephedrine or morphine to prevent bronchial spasm, were administered. Pleurisy was properly treated and, in time, artificial pneumothorax was reestablished. In 1 case rupture and spontaneous pneumothorax were prevented by the aforementioned treatment as soon as the diagnosis of threatening rupture was made.

Revista Medica Latino-Americana, Buenos Aires**26:471-564 (Feb.) 1941. Partial Index*****Peyote: Clinical Effects.** L. Bard.—p. 471.

Peyote.—Bard reviews the history of peyote from ethnographic, popular and religious aspects, and its effects. Peyote is a spineless cactus which grows in the northern part of Mexico. It contains several alkaloids, one of which is mescaline. The effects of the plant vary with the moral, cultural and constitutional type of the victim and with habituation. Indians frequently become accustomed to its consumption and attribute to it properties of stimulating physical energy and religious feeling. They do not have hallucinations. In the unaccustomed it produces a drunkenness of a special type with an early reaction of physical and mental stimulation followed by euphoria and a second phase of physical and mental sedation and stimulation of the senses, especially of vision and

hearing, with consequent production of colored visual and auditory hallucinations. During the first phase the victim presents a wild maniacal appearance and becomes merry and talkative. The eyes are bright, the stare deep and threatening. Mydriasis becomes evident. The acuity of vision and hearing become much increased. Blood pressure is slightly increased and respiration slightly accelerated. Early in the second phase the victim enters into a condition of pleasant semidreaming and euphoria, as though he were in a sphere of calm and beauty. Hallucinations which follow may be so extravagant and fantastic, especially in psychopathic persons, as to compare with those of the Arabian Nights. These two phases are followed by the last short phase of nervous depression. In cases of chronic peyotism chronic changes of the voice, disturbances of digestion and diseases of the digestive tract occur and nervous symptoms appear. The author made clinical observations on 5 normal, not addicted, well educated persons and persons without any cultural education. A dose of 0.2 Gm. of mescaline sulfate by mouth or 0.1 Gm. intramuscularly produced hallucinations. Large doses produced a drunken stupor. Hallucinations may be plain in color, with light or with apparent irradiations. They are capable of appearing in daylight, artificial light or darkness with the eyes opened or closed. The colors are brighter than naturally. In hallucinations of objects seen in darkness, the colors of the short waves of the ocular spectrum are predominant. Auditory hallucinations become associated with the visual. Colored and geographic hallucinations do not necessarily appear when the victims hear the names of vowels, consonants, or names of countries. Hearing names of persons and notes played on a violin cause colored geometrical hallucinations. Peyote hallucinations are extravagant and most often colorful. The type of hallucinations differs with vagotonic and sympathetotonic persons. In the psychopathic they are so intense and apparently real that they seem almost tangible. Victims with endocrine dysfunctions react differently from normal persons. Although peyote hallucinations are of the schizophrenic type, they differ in their pathologic fields. Patients with schizophrenia are convinced of the concrete presence of the constituent factors of their hallucinations, whereas victims of peyote intoxication recognize hallucinations as such.

Beiträge zur Klinik der Tuberkulose, Berlin**95:173-450 (Sept. 26) 1940. Partial Index****Ludolph Brauer's Seventy-Fifth Birthday.** H. W. Knipping.—p. 173.
Bilateral Collapse Therapy, Exclusive of Simultaneous Bilateral Intrapleural Pneumothorax. H. Alexander.—p. 182.***Aspiration Drainage in Tuberculous Lung Cavities.** W. Berblinger.—p. 228.**Pulmonary Circulation Under Pathologic Conditions.** L. de Carvalho.—p. 262.***Therapeutic Value of Sanoerysin on Basis of Comparative Clinical Investigations.** H. Møllgaard.—p. 369.**Significance of Unusual Spontaneous Healing in Pulmonary Tuberculosis.** H. Schulte-Tigges.—p. 409.

Monaldi's Aspiration in Tuberculous Lung Cavities.—Berblinger reports the morphologic observations made at necropsy in 9 cases of pulmonary tuberculosis in which Monaldi's procedure had been employed for cavity drainage. The author's interest lay in examining, both macroscopically and microscopically, the effects of this method on the puncture path, the cavity itself, the cavity walls, the surrounding lung tissues and the draining bronchi. The age of the patients, almost equally divided as to sex, had ranged between 22 and 37 years (45 years in 1 case). Drainage therapy had lasted from eight to ninety-two days (average thirty-three days). The infection concerned cavities of average and very large dimensions in both superior lobes. Only two deaths were directly due to the method used. In nearly all cases, specific tuberculous alterations were observed in the puncture canal, along with nonspecific inflammatory processes, but no complications from this source, the author says, need to be feared. The aspiration method seemed to affect favorably the diminution of the exudative caseous detritus. There is a hypcremic vascularization in the cavity walls, but no serious hemorrhages should occur if the method is properly carried out. In several cases local pericavitary emphysema and pericavitary atelectasis had apparently promoted cavity reduction. In several of such cases

in which obliteration of the cavity could be observed clinically, roentgenologically and anatomically the destructive tuberculous bronchitis had narrowed the draining bronchi, but no bronchitic extension was seen in the fibrous tissue of the closed draining bronchi. When the method did not effect closure of the draining bronchi, regarded by the author as of great importance, it ultimately was able to free the cavity from the specific tuberculous products. Berblinger believes that the pathologic and physiologic bases on which Monaldi's method rests have, to a certain degree, been confirmed by his morphologic investigations. The method, however, should be tried out on a more extensive scale. It possesses two valuable features, evacuation of the cavity contents and closure of the draining bronchi.

Therapeutic Value of Sanocrysin.—Møllgaard compiled the records of a number of hospitals and sanatoriums with regard to the use made of sanocrysin in the treatment of pulmonary tuberculosis both with and without control observations. He found that in five hospitals, in which 346 patients had been treated with sanocrysin and 301 had been used as controls, the favorable results (cures and ameliorations) favored the sanocrysin-treated group with 68.5 per cent as against 37.2 per cent for those given the usual hospital and sanatorium treatment. The negative results (aggravation and mortality rate) were lower for the sanocrysin-treated group (25.2 per cent against 46.5 per cent), the favorable balance affecting all stages of the disease. In checking the degree to which the sputum had become free from bacilli, though the statistics varied for different institutions, sanocrysin therapy was found to be clearly superior in its efficacy not only to sanatorium treatment but also to the therapeutic measures used adjutantly. Pneumothorax, however, proved to be a good auxiliary yet secondary to sanocrysin. Out of 204 cases pneumothorax was able to produce a bacillary-negative sputum in 115 (56.3 per cent), whereas sanocrysin gave similar results in 184 of 285 cases (64.6 per cent). Sanocrysin may be regarded as helpful also in pneumothorax with contralateral involvement. Statistics of cases in which sanocrysin was employed without control observations seemed to indicate that from 80 to 90 per cent of the milder cases of pulmonary tuberculosis in its initial stages could be clinically cured. According to the author the view that shock, albuminuria and lowered temperature constitute reactions set up by the nonimmune organism, while an elevated temperature is due to partial immunization, has been confirmed by several investigators and by his own experiments on rabbits and calves. A certain affinity seems to exist between sanocrysin and one or more constituent elements of the tuberculous process.

Klinische Wochenschrift, Berlin

19:1273-1296 (Dec. 14) 1940

Experimental Investigations in Chemotherapy of Tuberculosis. R. Prigge.—p. 1273.

Traumatic Heart Lesions. G. W. Parade and B. Rating.—p. 1276.

*Intolerance to Arsphenamine and Vitamin C. A. Welcker.—p. 1281.

Increased Toxicity of Anterior Lobe Hypophysial Extracts After Treatment with Concentrated Sodium Hydroxide in Animal Experimentation. K. von Pallos and L. von Vegh.—p. 1286.

Newer Methods of Determining Disturbances in Peripheral Vessels. E. Baráth.—p. 1289.

Intolerance to Arsphenamine and Vitamin C.—Welcker found in his investigation of 22 cases exhibiting intolerance to arsphenamine or arsphenamine dermatitis that the use of vitamin C had a favorable effect on these conditions. While he is of the opinion that no connection exists between vitamin C levels and either clinical phenomenon, the fact that a slight seasonal increase of drug intolerance and dermatitis was observed in the months in which vegetables and fruit are scarce makes it difficult to deny some connection. The administration of vitamin C acted curatively as well as prophylactically. Intravenous or intramuscular doses of 300 mg. a day rapidly controlled inflammation, edema and pyrexia. Experiments with associated drugs gave varied results. In some cases vitamin C therapy could be conducted to a successful termination by changing the particular brand of arsphenamine used. The author does not believe that vitamin C deficiency is causative of arsphenamine dermatitis except in pronounced cases.

Bulletin of the Naval Medical Association, Tokyo 30:1-76 (Jan. 15) 1941. Partial Index

*Vitamin C Determination of Cerebrospinal Fluid in Surgical Conditions. I. Kobayashi.—p. 1.

*Weltmann-Havas Reaction and Lactogelification Test (Kopaczewski) in Tuberculosis in Relation to Erythrocyte Sedimentation. T. Okamura.—p. 36.

Vitamin C in Cerebrospinal Fluid.—Using a modification of Tillman's method, Kobayashi made determinations of the vitamin C content of cerebrospinal fluids in 256 patients admitted to the Yokosuka Navy Hospital for surgical treatment of various diseases. In such conditions as hernia, acute appendicitis and hemorrhoids, the vitamin C content was near normal, which in his series was 1.7 mg. per hundred cubic centimeters on the average. A definite relation existed between the vitamin C content of the cerebrospinal fluid and the dietary habits of the patients, since the employees belonging to the low salaried group showed a tendency to lower values as compared with sailors and officers in the higher group. The vitamin C content of the cerebrospinal fluid in commissioned officers was generally high, the highest being 2.6 mg. per hundred cubic centimeters. The lowest figures were encountered among the employees (0.9 mg. per hundred cubic centimeters), although no demonstrable manifestations of vitamin C deficiency were clinically present. The author postulates some constitutional factors which influence the level of vitamin C in the cerebrospinal fluid.

Weltmann-Havas Reaction, Lactogelification and Sedimentation in Tuberculosis.—Okamura endeavored to correlate the results of Weltmann-Havas coagulation band reaction (344 cases) and of lactogelification tests (Kopaczewski) (251 cases) with the erythrocyte sedimentation rate in tuberculosis, using 9 normal subjects as controls. All tests were performed by micromodifications of the original methods, and the results were found to be as reliable as those obtained by the original procedures. The author found that, while no significant correlation existed between the Weltmann reaction and the sedimentation rate, a definite relation did exist between the Kopaczewski test and the suspension stability of the red cells. In tuberculosis the course and prognosis of the disease may be gauged by the use of all these tests.

Taiwan Igakkai Zasshi, Taihoku, Formosa

40:1-188 (Jan.) 1941. Partial Index

*Read's Formula for Estimation of Basal Metabolic Rate. T. Hattori.—p. 1.

Read's Formula in Basal Metabolism.—Although the accepted method of determining the basal metabolic rate is that of directly measuring the respiratory gas exchange under standard conditions, as originally devised by Knipping, Krogh and others, it can be thus practiced only in laboratories adequately equipped with a suitable instrument. For the approximate calculation of the metabolic rate, especially adaptable for use by clinicians at the patient's bedside, Read (1922) devised a simple formula: $0.75 (\text{pulse rate} + \text{pulse pressure} \times 0.74) - 72 = \pm X\%$. After his experience in applying this formula in 600 cases, Read reported the average error to be less than 20 per cent in nine tenths of the determinations, and less than 10 per cent in six tenths, as compared with the results obtained by the standard gas method. Read further added that the formula cannot be used in calculating the basal metabolic rate of patients suffering from decompensated cardiorenal diseases, arrhythmias or hypertension (160 mm. of mercury or over). In order to test the validity of Read's formula, Hattori determined the basal metabolic rate of 50 patients with various diseases including exophthalmic goiter but excluding those with decompensated cardiorenal conditions and with hypertension, by Knipping's gas exchange method. On calculating the metabolic rate from Read's formula in these cases Hattori found that the differences in the metabolic rate obtained by the two methods varied from 3 to 51 per cent, but the results were parallel in approximately half of his cases. From these findings the author concludes that the simplified formula of Read cannot be regarded as a substitute for the direct gas method, but that, once the rate has been determined by the gas method, Read's formula can be used for subsequent determinations in following the course of the disease.

Book Notices

A Preliminary Survey of the Industrial Hygiene Problem in the United States. By J. J. Bloomfield, Sanitary Engineer, et al. From the Division of Industrial Hygiene, National Institute of Health. Prepared by direction of the Surgeon General. Federal Security Agency, U. S. Public Health Service, Public Health Bulletin No. 259. Paper. Price, 20 cents. Pp. 132, with 16 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1940.

Public Health Bulletin number 259 summarizes effectively the findings and impressions gained through individual surveys of selected industrial plants conducted by personnel attached to bureaus of industrial hygiene in the health departments of fifteen states. Investigations in each of the states proceeded according to recommendations made by the Division of Industrial Hygiene in the National Institute of Health. An appendix describes in detail the steps taken to accumulate the data and in effect is entitled a reference manual for conducting industrial hygiene surveys. Separate reports had previously been prepared regarding the findings in the several states included in the survey. The most interesting statistics refer to the character of health risks to which workers are exposed in various occupations and the present status of medical, engineering and nursing supervision over working conditions in industrial plants. Observations made in large industries are for the most part encouraging. As far as the smaller plants are concerned, relatively few have undertaken to avail themselves of modern preventive industrial medicine. In this connection it is felt that divisions of industrial hygiene in state health departments can be of genuine assistance to the small plant operator in the detection and control of causes of lost time disability. Such activity can hardly fail to create a demand for competent industrial physicians and nurses. One important step in that direction is to arrange for proper recording of industrial absenteeism. The plan which has been devised by the U. S. Public Health Service is incorporated in the pamphlet, and instructions are provided regarding the use of recommended forms and blanks. The report emphasizes the need for proper integration between industrial hygiene services provided by official governmental agencies and the activities of independent organizations in this field. Particularly is it considered essential that industrial hygiene be correlated with the motivations and policies governing adult hygiene programs in general and with the efforts in this direction contributed by the practicing medical profession.

The Phosphatase Test for Control of Efficiency of Pasteurization. By H. D. Kay, R. Aschaffenburg and F. K. Neave. Imperial Bureau of Dairy Science, Technical Communication No. 1. Paper. Price, 2s. Pp. 53. Shinfield, Reading, England, 1939.

The phosphatase test has developed, during the past six years, into the most useful weapon for controlling the efficiency of milk pasteurization. The basis for this development is the fortunate combination of properties which this enzyme possesses in relation to milk. It is present in reasonably large quantities in all samples of raw milk; it remains practically unchanged for many hours in unheated milk, and for days if this milk is kept cold; its thermal stability is such that it is almost completely destroyed by exposure of the milk to the minimum temperature and time requirements for "legal" pasteurization; it is rather more resistant to heat than the common pathogenic organisms that may occur in raw milk; it is, in particular, slightly more resistant to heat over all ranges of time and temperature of heat exposure than is the tubercle organism; it can be detected and estimated in raw or heated milk in very small quantities; its detection and estimation in small quantities, though requiring a certain degree of laboratory skill and experience, is not difficult and needs neither elaborate apparatus nor complicated technic.

In connection with high temperature short time pasteurization, it will probably provide as sensitive and searching a method of control as it has provided for the "holder" pasteurization.

The chief medical officer of the Ministry of Health (England and Wales) stated, in 1936, "the phosphatase test is a valuable supplement to inspection of the plant and a positive result affords convincing evidence that pasteurization has not been efficiently carried out. The obligation to detect in what way the pasteurization plant or technic is at fault actually rests

with the licensee, and if he cannot deliver milk which satisfies the requirements of the phosphatase test he should not continue to hold a license."

Although the "holder" type of pasteurization is the only approved heat treatment permitted in Great Britain, it has been proposed that countries permitting other types of pasteurization should lay down no temperature or time conditions but simply insist that in heat-treated milk the phosphatase test, carried out under closely defined conditions, shall be negative, and the heating plant shall be otherwise satisfactory to the inspecting authority.

The U. S. Association of Official Agricultural Chemists has adopted Gilcreas and Davis's modification of the Kay-Graham test as a "tentative" method and has just completed a study of Schärer's short modification of the test. The American Public Health Association is considering studying the test to suggest modifications for the purpose of proposing a standard procedure.

In reviewing the present status of the phosphatase test, the authors have endeavored to draw attention to the various problems still awaiting solution, particularly those regarding products other than milk, in the hope that this course will stimulate further investigations. They confidently expect that further research will achieve for milk products what it has already achieved for milk itself, namely the provision in the phosphatase test of a safe and reliable method for controlling and supervising pasteurization.

Eugenic Sterilization in the United States: A Comparative Summary of Statutes and Review of Court Decisions. By James E. Hughes. Federal Security Agency, United States Public Health Service, Division of Sanitary Reports and Statistics. Supplement No. 162 to the Public Health Reports. Paper. Price, 10 cents. Pp. 45. Washington, D. C.: Supt. of Doc., Government Printing Office, 1940.

This pamphlet renders a striking service in the manner in which it presents in its first division a concise summary of the pertinent statutes of the thirty states that now authorize the performance of asexualization operations on socially inadequate persons. The summary is made easily comprehensible by the use of a series of tables, each table confined to one particular general aspect of the laws. Table 1, for instance, indicates the socially inadequate conditions (such as feeble-mindedness, insanity, epilepsy, habitual criminality, moral degeneracy or sexual perversion) which under each state law may be the basis of the asexualization procedure. There are similar tables indicating (1) whether the procedure can be applied only to inmates of state institutions or whether it can be applied to any affected person in the state, (2) the operations authorized, (3) initiating and adjudicating procedure, and (4) various other more technical, legal details, such as the type of proceeding, legal notice and appeal provisions. The pamphlet does not purport to, nor does it set out, the laws in full. A second division of the pamphlet consists of a review and an abstract of the decisions of courts of appellate jurisdiction that have construed the sterilization statutes. In the appendix there is a comprehensive and valuable list of the literature on sterilization in legal periodicals and of the general literature on sterilization. On the whole, the pamphlet is decidedly worth while and should be in the library of any one at all interested in the field of human sterilization.

Anatomie des Menschen: Ein Lehrbuch für Studierende und Ärzte. Von Hermann Braus. Band IV: Periphere Leitungsbahnen II. Haut und Sinnesorgane. Vegetatives Nervensystem. Fortgeführt von Curt Elze, o. ö. Professor an der Universität Direktor der Anatomie, Würzburg. Cloth. Price, 36 marks. Pp. 571, with 315 illustrations. Berlin: Julius Springer, 1940.

The blight of Hitler has not seriously injured Braus's textbook. The book as a whole is one of the best and differs from others so much in plan, conception and treatment that it should be in every good library of anatomy. Its special merits are: 1. Its close and thorough integration with general biology: Braus was a great biologist. Recently acquired biologic knowledge is seen to bring a good deal of help to our study of human structure and function. On a foundation of sound embryology this book integrates physiology and morphology. 2. Its consideration of the full course of life from development to senescence. 3. Its illustrations, which are beautiful and instructive and which by themselves constitute a valuable contribution to the already rich literature of anatomy. One defect lies in the relatively scant attention given the lymphatic system.

This volume has been edited by Prof. Curt Elze of Würzburg. Braus died in 1924 after the publication of the first two volumes. Elze continued the work, preparing second editions of those volumes and also volume III (1932) and volume IV (1940). The present volume deals (1) with the peripheral distribution of vessels (arterial, venous and lymphatic), of cerebrospinal nerves, (2) with the vegetative nervous system and (3) with the skin and sense organs. The vessels and peripheral nerves are considered together on a regional basis (trunk, extremities and head). The innervation of bones is treated much more satisfactorily than in most textbooks. A section of ten pages is devoted to a general consideration of the relationships between peripheral parts and the central nervous system. Thirty-seven pages are allotted to the vegetative nervous system, including the recent work of Otfried Foerster of Breslau done partly on lower animals and including three tables prepared by him showing the course of nerves from individual viscera through this system and their continuity or connection with anterior or posterior roots of individual spinal nerves. The treatment of head structures is interesting in that the poetic notion of the continuation of the segmentation of the trunk into the head does not appear. This theory, including a vertebrae theory of the skull, was dear to some of Braus's teachers. Professor Elze passes it by, treating the head as a special part.

All students of anatomy, the world over, will be grateful to Professors Braus and Elze and to their collaborators for an invaluable textbook on human anatomy.

Mine Eyes Have Seen: A Woman Doctor's Saga. By Alfreda Withington, M.D. With an introduction by the Late Sir Wilfred Grenfell. Cloth. Price, \$3.50. Pp. 311, with 41 illustrations. New York: E. P. Dutton & Co., Inc., 1941.

The author, Alfreda Withington, was one of the pioneer woman physicians in this country, having matriculated at the Woman's Medical College of the New York Infirmary in 1883. After graduation she traveled in Europe, studying in Vienna, Prague and other medical centers, and then located at Pittsfield, Mass., where she practiced for many years. In 1907 she went to Labrador to assist Sir Wilfred Grenfell for a season in his humanitarian work among the fishermen, then to return to Pittsfield. She became interested in the American Red Cross and, during the first World War, applied in 1917 for permission to serve with the Red Cross abroad. Returning to Pittsfield in 1921 with the vivid experience of war, she found it difficult to carry on in the previous ways. An advertisement in *THE JOURNAL* called for a woman doctor for settlement work in the Kentucky mountains, all calls to be made on horseback. She applied and was accepted. The review of her medical experience in the Kentucky mountains is well written and is the best part of this interesting book.

Disorders of the Blood: Diagnosis, Pathology, Treatment and Technique. By Lionel E. H. Whitby, C.V.O., M.C., M.D., Assistant Pathologist, The Bland-Sutton Institute of Pathology, The Middlesex Hospital, London, and C. J. C. Britton, M.D., D.P.H., Assistant Pathologist, The Bland-Sutton Institute of Pathology, The Middlesex Hospital. Third edition. Cloth. Price, \$7.50. Pp. 603, with 73 illustrations. Philadelphia: Blakiston Company, 1939.

In the present edition this work has been satisfactorily brought up to date. New material has been included mainly with reference to the hemolytic anemias, sternal biopsy and the hemorrhagic states. The beginning chapters are designed to provide a theoretical background for the study of hematology. They deal with the embryology of hemocytogenesis, the theories of its continuation in postnatal life under normal and abnormal conditions, and they review the information at hand concerned with the function and fate of the cells of the blood. The various theories of blood cell formation are mentioned, but that based on the work of Sabin, Doan and Cunningham is emphasized. The identification of the megaloblast as the precursor of the normal line of erythropoiesis is adhered to throughout, although mention is made of the fact that this is not universally accepted. The interpretation of the information derived from laboratory examinations of the blood is considered. The pathogenesis of the anemias is dealt with and the nature and mode of action of hemopoietic substances are discussed. Subsequent chapters deal with the various blood dyscrasias and related disorders grouped according to clinical diagnoses. The clinical features, blood and pathologic changes,

differential diagnosis, course, prognosis and treatment are considered. Miscellaneous conditions in which changes in the blood occur are briefly considered. A chapter is devoted to blood transfusions and one to disorders involving the blood pigments. The final chapter adequately describes the technique of carrying out the laboratory tests commonly employed in hematologic diagnosis. The book is clearly written; the material is judiciously chosen and well presented in a serviceable fashion. The subdivision of the chapters in a logical manner with bold type captions makes the material readily available, and inclusion of a summary at the end of the longer chapters will appeal particularly to medical students. The references at the end of each chapter include many recent articles and, although not exhaustive, are certainly representative.

McGillycuddy Agent: A Biography of Dr. Valentine T. McGillycuddy. By Julia B. McGillycuddy. Cloth. Price, \$3. Pp. 291, with 16 illustrations. Stanford University, Calif.: Stanford University Press; London: Oxford University Press, 1941.

McGillycuddy, a young graduate of Detroit Medical College, was advised on account of his health to go west and live in the open. That seems to have been sound advice, for he was 90 years old when he died two years ago. Many of those were strenuous years spent in army camps and outposts in the Dakotas, Nebraska and Wyoming, in the thick of Indian warfare in campaigns against the Sioux and the Cheyennes. McGillycuddy was nearby when Custer's gallant band was annihilated; he witnessed the killing of Crazy Horse, the famous Sioux warrior; he took part in many councils with Indian chiefs to assist in pacifying the Indians and preparing the western plains for the influx of the white man to that region. McGillycuddy later was appointed agent at Pine Ridge, which was the largest Indian agency in the country. He was a power among the huge Indian tribes, but with a change in the administration he was relieved of that responsibility, to settle down in Rapid City as a banker, as surgeon general on the governor's staff and as a developer of hydroelectric plants. He next went to San Francisco as medical inspector for an insurance company, a position which permitted him to travel over the great plains again and relive the hazardous but interesting life of Indian days. The spirit of the pioneers, the sadness of Indians driven from their lands, and the tramp of herds of buffalo are in these exciting stories.

O pishchevykh i oboronitelnykh sekretornykh i dvigatelnykh bezuslovnykh reaktsiyakh u sobaki. [By] R. B. Garibyan. [Alimentary and Defensive Secretary and Motor Unconditioned Reflexes in Dogs] Paper. Price, 3 rubles. Pp. 91, with 61 illustrations. Rostov on Don: Rostovskoe Oblastnoe Knigizdatel'stvo, 1939.

The monograph by Garibyan is a report on experimental work carried out in the physiologic laboratory of the Medical Institute of Rostov. It represents an interesting approach to the problem of the influence of the midbrain on behavior. The author proceeds from the premises of Pavlov that there exist special centers for the alimentary and the defense reflexes. The author made use of the well known method of demonstrating the alimentary reflex through observation of salivary secretion. The defense reactions were studied by systematic observations of the oral movements in response to direct stimuli. The specificity of the frequency of these movements proved to be an even more constant index than the specificity of the salivary response. This is a preliminary investigation whose ultimate aim is to elucidate the role of the midbrain, which is regarded as a stage in the evolutionary development reflecting an important phase in the development of the unification of reactions of an animal to its surroundings. The monograph should prove of interest to the physiologist and the neuropathologist.

The Anaerobic Bacteria and Their Activities in Nature and Disease. A Subject Bibliography. By L. S. McClung and Elizabeth McCoy. Supplement I: Literature for 1938 and 1939. Cloth. Price, \$3.50. Pp. 244. Berkeley & Los Angeles: University of California Press; London: Cambridge University Press, 1941.

In this book the authors have gathered together a chronological list of references on the anaerobic bacteria for the years 1938 and 1939 (and some from 1940). The bibliography is classified and includes headings for habitat, culture methods, metabolism and relations to disease. The book should be exceedingly useful to all those engaged in laboratory or clinical work dealing with organisms of this group.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

SMOKING AND PEPTIC ULCER

To the Editor:—Kindly advise whether or not there is authentic evidence that smoking slows up or stops improvement in the treatment (medical) of peptic ulcer. M.D., Illinois

ANSWER.—It is not uncommonly stated or implied in the literature that smoking may delay healing or favor recurrence of chronic peptic ulcer, particularly when smoking is excessive. This impression is based largely on the clinical observation that in some people ulcer symptoms seemingly appear or become aggravated when more than a certain amount of tobacco is used. In others, distress may appear to be more readily controlled when they do not smoke. Such indirect evidence, although inconclusive, cannot be entirely disregarded. The fact that smoking is without apparent deleterious effect on most ulcer patients does not, of course, exclude the possibility that it may be harmful to a few. The clinical evidence, however, is equivocal. In many of the most difficult ulcer cases tobacco has never been used, whereas tractable ulcers are not infrequently encountered in inveterate smokers.

Hurst and Stewart (Gastric and Duodenal Ulcer, New York, Oxford University Press, 1929, p. 69) attributed an important role to smoking, particularly in cases of duodenal ulcer. In addition to some clinical impressions, they cite statistical data in support of this contention. They were impressed by the apparently increasing incidence of duodenal ulcer in women since smoking became more prevalent among them. Conclusive statistical evidence is lacking, however, that women smokers have a higher incidence of duodenal ulcer than nonsmokers. It should be stressed that the roentgenologist's ability to diagnose duodenal ulcer has advanced greatly in the past twenty to twenty-five years and this is, perhaps, not always sufficiently emphasized in the analysis of statistical information. Schnedorf and Ivy (Effect of Tobacco Smoking on Alimentary Tract: Experimental Study of Man and Animals, *THE JOURNAL*, March 11, 1939, p. 898) studied the effect of tobacco smoke and nicotine on the alimentary tract of human beings and dogs. They summarized their observations as follows:

"Smoking reflexly stimulates the secretion of saliva in most subjects. It reflexly inhibits or depresses the hunger motility of the stomach. When the smoking of an ordinary number of cigarettes has any effect on the stomach, it tends to depress secretion and to retard evacuation. Only in the occasional person does smoking tend to cause significant gastric retention and an increase in acidity. . . . None of the data we have obtained can be interpreted as directly indicating that smoking has a beneficial effect on the activities of the alimentary tract." These observations would seem to indicate that, in the majority of subjects with or without peptic ulcer at the time of the experiment, smoking caused no effect which would retard the healing of an ulcer. It should be noted, however, that in an occasional person smoking caused a significant gastric retention and an increase in acidity. In such an occasional person smoking could conceivably interfere with or delay healing of a peptic ulcer. There is, however, no conclusive clinical or experimental evidence to indicate that this has actually been observed.

HYDROA VACCINIFORME

To the Editor:—During the past three years I have seen a number of cases of hydroa vacciniforme among young Indians in South Dakota and Montana. Many of the cases are of a severe nature, especially during the summer. All treatment recommended in dermatologic books is merely of a palliative type, the lesions reappearing on exposure to sun, wind and dust. Can you recommend any specific therapy?

Dean J. Dorius, M.D., Lome Deer, Mont.

ANSWER.—Hydroa vacciniforme is anything but a common disease and it is remarkable to see so many cases among the Indians of the Northwest. If the diagnosis is correct, an investigation of these tribes offers a promising field for the study of the light-sensitive dermatoses. In answer to a question on the subject of light sensitivity (Hypersensitiveness to Light, *THE JOURNAL*, March 31, 1934, p. 1103) several possible etiologic factors that should be investigated in cases of this nature were suggested: the possible ingestion of sulfonal, lead poisoning,

inadequacy of the liver and the ingestion of buckwheat. There are many other substances besides sulfonal and buckwheat which produce hypersensitivity to light, though they are perhaps less liable than these to be encountered in ordinary cases.

No specific treatment can be offered for this condition except the removal of sensitizing substances from the diet if these can be found or protection of the skin from light. A 5 per cent solution of disodium naphthol sulfonate in alcohol as a protective has been suggested. The most efficient protection was found by Bachem and Fantus (*Evolution of Skin Protection Against Ultraviolet Rays*, *Arch. Phys. Therapy* 20:69 [Feb.] 1939) to be afforded by an opaque powder, cuticolar titanium dioxide, composed of 6 parts of red ferric oxide, 8 parts of yellow ferric oxide and 86 parts of titanium dioxide. A lotion may be prepared as follows: 15 parts of cuticolar titanium dioxide, $2\frac{1}{2}$ parts of bentonite and stronger rose water to make 100 parts. Mix the bentonite and rose water and let stand over night or at least several hours. Decant, discarding the sediment. To the cuticolar titanium dioxide in a mortar add the bentonite solution in portions with trituration after each portion, until the mixture is brought to the full amount.

The investigations of Bachem and Fantus also showed that of the ointment bases yellow petrolatum and wool fat are the best for protection against light. An ointment may be made of 15 parts cuticolar titanium dioxide, 10 parts liquid petrolatum, $12\frac{1}{2}$ parts anhydrous wool fat, $37\frac{1}{2}$ parts yellow petrolatum and 25 parts stronger rose water. Mix the petrolatum and the wool fat, and incorporate the rose water in small portions until it is emulsified completely. Add the cuticolar titanium dioxide, incorporate thoroughly until smooth and then add the liquid petrolatum and mix until smooth.

Anderson and Ayres (*Light Sensitive Dermatoses*, *THE JOURNAL*, Oct. 27, 1934, p. 1279) mentioned Urbach's use of a carbohydrate and liver diet in cases of actinic dermatitis, on the theory that the efficient liver protects against such sensitivity by destroying the sensitizing substances.

In a situation such as is suggested by the query, the presence of so many cases of light sensitivity among the members of a group which no doubt has a dietary different from the ordinary, the possibility of vitamin deficiency should not be overlooked.

PROBABLE PILOCARPINE INTOXICATION

To the Editor:—A white woman aged 62 has been noticing increasing weakness, loss of weight, mental depression bordering on melancholia, nausea, occasional vomiting, profuse salivation and sweating and a low grade temperature on occasions. Examination reveals the following pertinent data: a glass right eye; a constricted, nonreacting left pupil; evidence of loss of weight; profuse salivation (there are two dental plates without irritation in the mouth); sweating; a pulse regular with occasional premature ventricular contractions and normal blood pressure. The bowels are somewhat constipated, and pelvic examination shows atrophic organs without evidence of any other pathologic condition. Postmenopausal bleeding prompted a diagnostic curettage, which revealed fibrotic endometrial tissue without evidence of malignancy. Gastric analysis showed normal acid values. There is a moderate secondary anemia. Roentgenograms of the gastrointestinal tract showed intense hypermotility of the entire tract. Ten minutes after the patient ingested boric sulfate, some could be seen in the transverse colon. The entire colon showed hypertonicity. On close questioning, it is revealed that the patient has been using about 6 drops of 1 per cent pilocarpine in the left eye daily for about ten years. Is it possible that she has a chronic form of poisoning with pilocarpine from systemic absorption? Please discuss this. I would appreciate references in the literature about similar cases.

Lawrence S. Ward, M.D., Niantic, Conn.

ANSWER.—Absorption of pilocarpine from the gastrointestinal tract is slow, and the action is prolonged. It is excreted in the urine both unchanged and conjugated. In all probability the 6 drops used daily were used 1 or 2 drops at a time, which would give a continuous absorption. Even minute doses of pilocarpine cause a hypermotility of the stomach and the bowels with a hypertonicity of the entire gastrointestinal tract but especially of the colon. The pylorus and the ileocolic sphincter may be caused to contract and thus, at times, the passage of food may be delayed. Pilocarpine may cause nausea and occasional vomiting. This is due to its central action. It also causes profuse salivation and sweating and a fixation and constriction of the pupil.

The patient described apparently was taking about $\frac{3}{4}$ grain (0.004 Gm.) daily. This is admittedly a small dose but was used in such a way that there was a gradual and almost continuous absorption. Used over a long time this could cause a chronic intoxication. The symptoms are certainly in accord with what might be expected. The nausea and occasional vomiting, the moderate degree of constipation, which may be due to the action of the drug on the sphincters of the gastrointestinal tract as well as the considerable loss of fluid from the body through profuse sweating, the hypermotility of the entire tract,

QUERIES AND MINOR NOTES

the hypertonicity of the colon, the loss in weight, the profuse sweating and salivation and the fixed, constricted pupil are all consistent with a diagnosis of chronic intoxication with pilocarpine.

As a therapeutic and diagnostic test, atropine sulfate could be given unless there is a definite contraindication to this. Relief from many of the aforementioned symptoms would be further proof of the correctness of the diagnosis.

A search of the literature has failed to reveal records of similar cases.

or 5 mg. by mouth being used. Ergotamine tartrate is not curative but merely aborts each attack. If the optimal dose is effective, it should be gradually reduced to the minimal effective level.

Jaur. A. M. A.
July 5, 1941

SIGNS IN HYPERTENSIVE HEART DISEASE AND NEPHRITIS

To the Editor:—Several controversial points have arisen here in the past month. A resort to books has been to no avail. It seems to be difficult to believe their statements when they conflict with actual experience. Here are the points in question: 1. In the great majority of cases of hypertensive heart disease, a systolic murmur is heard at the apex. 2. Dull pain in the lumbar region is frequently a symptom of acute nephritis. 3. (a) With few red blood cells in the urine, it follows that albumin will almost always be found; (b) with many red cells present in the urine, albumin will always be found; (c) when a few granular casts are seen microscopically, albumin should be detected in the urine.

M.D., New York.

ANSWER.—1. It is true that an apical systolic murmur is heard in the great majority of cases of hypertensive heart disease if this diagnosis is made on the basis of chronic hypertension and weakness of the left ventricle. Relative dilatation of the mitral ring or arteriosclerotic changes in the leaflets may account for the murmur.

2. Yes; but it is of little diagnostic value in this disease. 3. (a) This is true if the microscopic hematuria is the result of glomerulonephritis or diffuse renal vascular disease but not if it is due to conditions in the lower part of the urinary tract or other urologic conditions. (b) This is true because blood plasma or serum is then present in the urine in sufficient amounts to give positive protein reactions. (c) This is not necessarily true, because a few casts may form as the result of localized tubular damage in the absence of proteinuria, which arises from the glomeruli. Furthermore, a small amount of protein may not be detectable in dilute urine by the ordinary clinical tests, particularly if the urine is not properly acidified.

SENSITIVITY TO COLD AND DRAFTS

To the Editor:—A few patients complain of feeling cold even in temperatures of 72 F. and usually need 78 F. to be comfortable in their homes. I have one at present whose blood and metabolism are normal and who is well in other respects but chills easily; as in theaters, from the slightest motion of air. I hear that injection of calcium remedies such a complaint. If so please inform me the form and amount as well as any other specific cure. This otherwise healthy patient, aged 50, has been unable to travel to a milder climate and has felt the cold here in the winter although the temperature seldom falls below 40 F. With extra heavy clothes or when exercising, he is comfortable provided he does not perspire excessively. If the latter is the case, he finds that he is chilly soon unless relieved by a warm bath followed by a cold shower and a change of underclothes.

M.D., Oregon.

ANSWER.—Sensitivity to cold usually implies poor circulation. There are numerous explanations for a decrease in the amount of blood passing through the peripheral tissues, but one should always bear in mind mild degrees of hypothyroidism. Although the patient in question is said to have a normal metabolism, it must be borne in mind that the first determinations are frequently higher than the true metabolic rate. If the patients in question suffer from chronic fatigue, irritability, dry hair, dry skin and brittle nails, it would be worth trying thyroid in a dosage of 0.03 Gm. (½ grain) daily for at least a month. Sometimes a second metabolism test while on a small dose of thyroid will be found lower than the original determination.

RIGOR MORTIS OF FETUS

To the Editor:—Is a baby which dies in utero ever born in complete rigor mortis, if the delivery takes place within a few hours after death of the fetus?

Raymond H. Goodale, M.D., Worcester, Mass.

ANSWER.—Rigor mortis occurs in the dead fetus both ante and post partum. As compared with adult bodies, this phenomenon develops early and disappears rapidly. Paddock (*Am. J. Obst. & Gynec.* 48:145 [Aug.] 1903) reported 2 cases, 1 in a multipara and the other in a primipara in which dystocia was caused by the development of rigor mortis in a dead fetus in utero. For a comprehensive review of the subject the inquirer is referred to Dr. W. J. Ballantyne (*Teratologica* 2:96 [April] 1895). Other references:

Taylor, A. S.: Principles and Practice of Medical Jurisprudence, ed. 9. London, J. & A. Churchill, 1934, vol. 1.
Smith, Sidney: Forensic Medicine, ed. 4. London, J. & A. Churchill, 1934, p. 19.

POSTMENOPAUSAL ATYPICAL MIGRAINE

To the Editor:—A healthy woman aged 51, who has passed the menopause, has had headaches for the past thirty years, at first with each menstrual period but now occurring once or twice weekly, usually on Wednesday or Saturday, and with increasing intensity. The distribution is behind the eye, over the cheek and in the occipital region, sometimes on the left and sometimes on the right side. The headaches last from several hours to thirty-six hours. The frontal area is rarely if ever involved. Headaches begin about 3 p. m., never in the morning or night, and usually continue through the next day if not attended to. Acetylsalicylic acid and phenacetin compound at the onset of the headache sometimes controls it, but usually the patient resorts to hypodermic injections of gynergen (ergotamine tartrate) for relief, and this is just transient. Headaches are not preceded by an aura of dimness of vision or diplopia, although her attacks have been branded as migraine. She never has gastrointestinal symptoms with attacks. She has had two pregnancies and normal deliveries, with a significant history of headache for the first three months in each case and absence of headaches for the last six months, the only prolonged absence of headaches for the last thirty years. Asthenia is excessive; she is tired all the time. The blood pressure is 110 systolic and 80 diastolic, the pulse rate 74, and the blood cell count normal. The last determined basal metabolic rate six months ago was —13 per cent. Amniotin was given intramuscularly for her hot flashes, but this had no effect on the headaches. During one of her attacks there was a definite engorgement of the temporal vein on the affected side. No other signs were present. I cocaineized the sphenopalatine ganglion on the involved side and washed out the posterior sinuses by the Praetx method with some amelioration but no cessation. On the supposition that this was a "histamine" type of headache or vascular headache as reported by Horton and McLean (*Proc. Staff Meet., Mayo Clin.* 14:257 [April 26] 1939) I started her on the histamine therapy as they advise. In addition I administered 3 cc. of aqueous carpus luteum extract by injection. Can you tell me from the description what I'm dealing with? Is it a hormonal, estragenic, vascular or other type of headache? What factor was responsible for the cessation of headaches for six months during the last two trimesters of her pregnancies? Was it a corpus luteum or a pituitary hormonal factor that brought on the relief? I feel that if I can replace in her present makeup that which was present at the time of the last six months of her pregnancy the problem will be solved. I have given her ½ grain (0.03 Gm.) of a thyroid preparation twice daily for the past week, but this made her nervous and caused her pulse rate to rise to from 90 to 96 by night time. I have since stopped this medication.

M.D., California.

ANSWER.—Thirty years of recurrent, alternating hemicrania, at first coincidental with the menses and now (postmenopausally) occurring twice a week, is suggestive of migraine. Absence of headaches during the last six months of each pregnancy is characteristic of migraine, as are the swollen temporal vein during a headache and the habitual relief with ergotamine tartrate. The location of the headache, as well as the absence of visual and gastric symptoms, is atypical but not exclusive. The patient described seems to be suffering from the all too frequent picture of postmenopausal atypical migraine. Therapy in these cases is difficult.

In any case of migraine it is difficult to determine whether the situation is primarily hormonal, allergic or due to some other factor. In all, the pain is fundamentally vascular or perivascular. The cause of the migraine is probably not endocrine, since headaches occurred in the presence or absence of ovaries. It is probable, however, that the hormonal secretions influenced the migraine secondarily. Reproduction of the conditions obtaining during pregnancy is difficult because of large amounts of estrogen and progesterone which are circulating during pregnancy. Neither pituitary nor thyroid has been found helpful. Too much faith should not be placed in endocrine therapy. If it is unsuccessful, ligation and section of the temporal arteries may be considered. One should be done at a time, the second section depending on the results of the first. In this case ligation of the occipital artery may be indicated.

It is of vital importance to treat the patient as a whole. Estrogenic therapy is indicated for the continued menopause, irrespective of its effect on the headache. Psychologic and social problems should be corrected, diet maintained, the bowels regulated. The use of 7 liters of oxygen per minute for from one to three hours by inhalation with a Boothby mask is also to be strongly recommended in a case such as this as a means of aborting individual attacks.

When it is necessary to use ergotamine tartrate, it must be given early in the attack, 1 cc. given subcutaneously (0.5 mg.)

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STUDIES IN IMMUNITY TO PERTUSSIS

AN EVALUATION OF PERTUSSIS VACCINATION BY
CLINICAL MEANS AND BY THE OPSONOCYTO-
PHAGIC TEST

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There have been a number of surveys in recent literature concerned with the value of pertussis vaccination.¹ Some of these have been mainly or entirely based on clinical statistics, whereas others have been laboratory studies. Clinically, immunity to pertussis is difficult to determine because children cannot purposely be exposed to the disease. In order to evaluate the efficacy of pertussis vaccination by clinical means a study extending over a period of years must be made, comparing the incidence of the disease in the vaccinated and the nonvaccinated control group under conditions as nearly similar as possible in regard to susceptibility and exposure. Excellent studies of this type have been done by Sauer,² Kendrick and Eldering³ and Singer-Brooks.⁴ It is generally agreed, however, that with clinical surveys alone it is difficult to prove the efficacy of pertussis vaccination.

REVIEW OF CLINICAL LITERATURE

Most observers working from a clinical point of view with phase I *Haemophilus pertussis* vaccine have obtained strikingly similar results. Sauer² reported 32 cases of pertussis in 2,453 vaccinated children (1.3 per cent) and 286 cases in 1,730 controls (16.5 per cent). Kendrick and Eldering³ observed 4,212 children for forty-four months. Of this number 1,815 received *H. pertussis* vaccine and 2,397 nonvaccinated children served as controls. Of the vaccinated group pertussis developed in 52, or 2.8 per cent, while 345, or 14.3 per cent, of the control group contracted the disease. In their study, 297 of the vaccinated children had known exposures with the development of pertussis

in 35 cases, or an incidence of 12.5 per cent, while in the nonvaccinated group there were 273 who had known exposures with pertussis developing in 157, or 68.5 per cent. Recently Singer-Brooks⁴ has summarized her work in the controlled study of 330 vaccinated children of whom 64 had known exposures with the development of pertussis in 5, or 7.8 per cent. Among 200 nonvaccinated familial controls, there were 45 who had known exposures with 44, or 97.7 per cent, who contracted the disease. Similar results have been reported by Miller and Faber,⁵ Shorr⁶ and Silverthorne and Fraser.⁷ Doull and his associates⁸ have obtained results which are at variance with those of other observers. Table 1 summarizes the observations of these various investigators.

Clinical Study.—Our study was made on a group of 379 infants and young children, all of premature birth, and extended from Jan. 1, 1936 to Dec. 31, 1939. There were 140 siblings who served as familial controls. No other controls were used because an attempt was made to compare the disease under as nearly identical conditions of exposure as possible. Only normal premature infants were used in this study. Phase I *H. pertussis* vaccine,⁹ containing 10,000 million bacteria per cubic centimeter, was given at the age of 6 months in four doses at weekly intervals—the first week 1 cc. (in the left deltoid area), the second and third weeks 2 cc. each and the fourth week 3 cc. The second, third and fourth injections were divided and given in each arm, care being taken to select a different area for each injection. It was felt advisable to give the injections in four doses because of the small size of the infants.

Reactions to Vaccine.—Reactions were arbitrarily classified as mild, moderate or severe. Mild reactions were those in which erythema and induration occurred without systemic symptoms. Moderate reactions were those in which some fever and irritability resulted. Severe reactions were those in which high fever and actual illness occurred. Almost all the infants had some erythema and induration after each injection. Seventy-seven infants were classified as having moderate reactions, the rectal temperature usually ranging between 101 and 102 F. Seven infants had high temperatures (103 to 104 F. rectally), and 1 of these had convulsions twelve hours after the third injection. The reaction, when present, usually began about four hours after

5. Miller, J. J., Jr., and Faber, H. K.: Immunization Against Pertussis, *J. A. M. A.* **112**: 1145-1148 (March 25) 1939.

6. Shorr, E. Y.: Prophylactic Pertussis Immunization, *J. Pediat.* **9**: 49-55 (July) 1936.

7. Silverthorne, L. N., and Fraser, D. T.: Whooping Cough, *Canad. M. A. J.* **38**: 556-559 (June) 1938.

8. Doull, J. A.; Shibley, G. S., and McClelland, J. E.: Active Immunization Against Whooping Cough, *Am. J. Pub. Health* **26**: 1097-1105 (Nov.) 1936.

9. The preparation of this vaccine is fully described in Kendrick, Pearl; Lawson, G. M., and Miller, J. J.: Tentative Methods for the Bacterial Diagnosis and Control of Whooping Cough, in *American Public Health Association Year Book, 1935-1936*, New York, American Public Health Association, pp. 200-206.

Funds and vaccine for this work were supplied by The Upjohn Company, Kalamazoo, Mich.

From the Sarah Morris Hospital for Children and the Nelson Morris Institute for Medical Research, Michael Reese Hospital.

1. Where the term vaccination is used in this report, inoculation with phase I *Haemophilus pertussis* vaccine is meant.

2. Sauer, L. W.: Whooping Cough Prophylaxis, *J. A. M. A.* **112**: 305-308 (Jan. 28) 1939.

3. Kendrick, Pearl, and Eldering, Grace: A Study in Active Immunization Against Pertussis, *Am. J. Hyg.* **29**: 3, Sec. B, 133-153 (May) 1939.

4. Singer-Brooks, Charlotte: Pertussis Prophylaxis: Controlled Study, *J. A. M. A.* **114**: 1734-1740 (May 4) 1940.

inoculation and lasted for about twelve to forty-eight hours. Reactions were equally likely to appear after any one of the injections. No abscesses or scars resulted from any injections, though occasionally induration persisted for several weeks.

Incidence of Pertussis in Vaccinated and Control Groups.—In the vaccinated group there were 58 known exposures to pertussis, with the subsequent development of 9 cases, or 15.5 per cent. In the control group of 140 siblings there were 47 known exposures with the development of 37 cases, or 78.7 per cent. These figures are comparable to those of most other observers (table 1). In an attempt to compare the severity of cases of pertussis in the vaccinated and control groups, all children with the disease were visited at home by a nurse specially trained in work with contagious disease. A case of mild involvement was classified as one in which no vomiting or choking spells occurred and in which the diagnosis was confirmed by a blood count or cough plate or both. All other cases were classified as of severe involvement. In five families in which a vaccinated child had the disease, the condition was

group has found the reaction positive in unvaccinated children with no history of the disease.¹¹ Recently Thompson,¹² after an investigation of 1,300 children, concluded that the intradermal response to Sauer's

TABLE 2.—Data on Patients in Whom Pertussis Developed After Vaccination

Patient	Age of Patient at Onset of Pertussis	Time Interval Between Vaccination and Onset of Pertussis	Severity of Disease
1.....	3 yr. 6 mo.	15 mo.	Mild
2.....	4 yr.	21 mo.	Mild
3.....	16 mo.	0 mo.	Mild
4.....	18 mo.	11 mo.	Mild
5.....	12 mo.	5 mo.	Severe
6.....	23 mo.	16 mo.	Mild
7.....	5 yr. 10 mo.	13 mo.	Mild
8.....	5 yr. 10 mo.	13 mo.	Mild
9.....	2 yr. 0 mo.	18 mo.	Severe

vaccine is of no value in demonstrating immunity to whooping cough. He expressed the belief that this is due to the fact that the bacterial content of the vaccine appears to be too high for purposes of cutaneous testing,

TABLE 1.—Summary of Clinical Studies of Pertussis Vaccination Reported by Various Investigators

Author	Type of Vaccine	Patients Vaccinated	No. of Cases	Control Group	No. of Cases	No. of Known Exposures (Vaccinated Group)	No. of Cases (Vaccinated Group)	No. of Known Exposures (Control Group)	No. of Cases (Control Group)
Sauer.....	H. pertussis phase I, 80 billion...	2,453	32 (1.3%)	1,730	286 (10.5%)	..	..	..	..
Singer-Brooks.....	H. pertussis phase I, 80 billion...	330	..	200	...	64	5 (7.8%)	45	44 (97.7%)
*Miller and Faber.....	H. pertussis phase I, 80 billion...	211	..	182	...	29	0 (31%)	32	29 (90.6%)
Shorr.....	Sauer 11 and Mishulow vaccine-63	74	..	72	...	3	1	..	..
Doull, Shibley and McClelland	Own vaccine.....	342	54 (15.8%)	385	70 (18.2%)	21	10	..	26
Silverthorne and Fraser.....	H. pertussis phase I, 80 billion...	747	..	161	...	41	2 (4.8%)	27	23 (85.2%)
Kendrick and Elderling.....	H. pertussis phase I, 70 billion...	1,815	52 (2.8%)	2,307	348 (14.3%)	207	28 (12.8%)	273	157 (58.5%)
Present series.....	H. pertussis phase I, 80 billion...	379	..	140	...	53	9 (15.5%)	47	37 (78.7%)

classified as mild, while in these same families the illnesses of 7 siblings who had the disease were classified as severe. No complications occurred in the vaccinated group, while there were 2 cases of bronchopneumonia in the control group. Cases developed from five months to twenty-one months after vaccination, all but 3 occurring more than one year after vaccination (table 2). It is appreciated that the number of cases is too small for any conclusions to be drawn, but these clinical observations correlated with the opsonocytophagic index, as noted later, have elicited interesting data.

REVIEW OF IMMUNOLOGIC LITERATURE

The problem of a suitable laboratory test for immunity following vaccination or following an attack of pertussis has been approached particularly from the standpoint of cutaneous reaction, complement fixation, agglutination and the opsonocytophagic test. Results of specific cutaneous testing have been conflicting. One group of observers has found the reaction positive in persons who have been vaccinated,¹⁰ while another

giving rise to inflammatory lesions of a nonspecific character rather than to specific allergic reactions. When the vaccine was diluted, the results were the same but less apparent.

The use of agglutination tests has also resulted in some conflict among investigators. Mishulow and her

TABLE 3.—Value and Rating of Reaction

Numerical Value	Rating of Reaction
0-25.....	Negative (0)
25-100.....	Weak (1+)
101-200.....	Moderate (2+)
201-300.....	Strong (3+)

associates¹³ found considerable variation in the response of agglutination of a group of 47 children and reported no titer higher than 1:250. Wu and Chu¹⁴ observed agglutination appearing after the second or third injection.

11. Siebler, Salmen, and Okrent, Samuel: Pertussis, J. Pediat. 4: 188-190 (Feb.) 1934.

12. Thompson, A. R.: The Intradermal Test in Whooping Cough, J. Hyg. 38: 104-119 (Jan.) 1938.

13. Mishulow, Lucy; Mowry, Isabelle, and Orange, Ruth: Agglutination Response in Pertussis Vaccination, J. Pediat. 9: 492-504 (Oct.) 1936.

14. Wu, J. P., and Chu, F. T.: Effect of Stimulating Dose of Pertussis Vaccine in Children Previously Immunized, Proc. Soc. Exper. Biol. & Med. 38: 693-695 (June) 1938.

10. Paterson, Donald; Bailey, R. H., and Waller, R. G.: Control of Whooping Cough with Serum Vaccine, Lancet 2: 361-364 (Aug. 17) 1935. O'Brien, Brian: Intradermal Tests for Susceptibility to Whooping Cough, Lancet 1: 131-132 (Jan. 16) 1937.

tion of vaccine, with a tendency to decline. Miller and Silverberg¹⁵ found that agglutination occurred in 161 of 164 children inoculated with H. pertussis vaccine and that the titer was in general high, usually 1:260 or

TABLE 4.—Summary of Opsonocytophagic Tests on Twenty Full Term Children with No Record of Immunization or History of Pertussis

Age Group	Number of Children Tested	Reaction Rating and Number of Children Giving Each Reaction				
		Negative 0	Weak 1+	Moderate 2+	Strong 3+	Average Reaction
Under 6 mo. of age	3	2	1	0	0	0.3
6 mo. to 1½ yr.	5	2	3	0	0	0.6
2 to 3½ yr.	7	3	4	0	0	0.6
4 to 5 yr.	5	2	2	1	0	0.8

higher. Occasionally specimens of serums observed as long as thirty-eight months after vaccination showed a tendency to maintenance of the titer.

ers¹⁹ to apply this test to a study of the response of immunity in pertussis. They found that the degree of phagocytosis increased during and after inoculation with H. pertussis vaccine, reaching a maximum after about two months, and then declined gradually, with a high degree of phagocytosis still being present after two years. This work was confirmed by Singer-Brooks and Miller.²⁰

As a test for the specificity of the opsonocytophagic test, several adults were inoculated by Kendrick¹⁹ with H. pertussis vaccine, and their blood was tested with various unrelated organisms. The reactions with the various antigens were too weak to suggest nonspecific reactions following the injection of vaccine. Singer-Brooks and Miller found that in their experience different smooth strains of H. pertussis gave considerable variation in titer when used to test the same person's blood. They expressed the belief that this factor was an objection to the specificity of the test. Kendrick

TABLE 5.—Summary of Opsonocytophagic Tests on Seventeen Mothers and Their 2 to 9 Week Old Premature Infants

Family Name	Age of Infant in Weeks	Mothers					Reaction	Numerical Value	Rating	Premature Infants					Reaction	Numerical Value	Rating
		Number of Organisms in Cells: Range								Number of Organisms in Cells: Range							
		0	1-5	6-20	21-40	41-60+				0	1-5	6-20	21-40	41-60+			
		Factor for Each Range								Factor for Each Range							
		0	1	3	8	12				0	1	3	8	12			
		Number of Neutrophils in Each Range								Number of Neutrophils in Each Range							
Bo.	3	0	5	12	6	2	113	2	0	9	5	0	76	Weak			
Br.	7	0	2	10	10	3	155	0	2	13	10	0	121	Moderate			
Co.	9	0	0	6	8	11	214	0	3	9	6	7	162	Moderate			
Da.	4	2	16	7	0	0	37	7	12	6	0	0	30	Weak			
Fr.	4½	0	8	17	0	0	50	2	7	14	2	0	65	Weak			
Ha.	6	1	3	15	5	1	100	0	8	12	5	0	84	Weak			
Man.	7	3	9	10	3	0	63	16	6	3	0	0	15	Negative			
Man.	7	3	9	10	3	0	63	11	10	4	0	0	22	Negative			
Mar.	6	0	4	10	10	1	126	1	3	14	7	0	102	Moderate			
No.	8	0	4	3	11	7	185	0	1	12	10	2	141	Moderate			
Ni.	6	2	13	10	0	0	43	5	11	9	0	0	38	Weak			
Ni.	6	2	13	10	0	0	43	6	10	7	2	0	47	Weak			
Ra.	6	3	4	12	6	0	88	6	4	13	2	0	59	Weak			
Sh.	9	2	3	9	8	3	130	3	5	8	8	1	105	Moderate			
Sm.	2½	6	10	6	3	0	52	14	9	2	0	0	15	Negative			
Th.	4½	2	10	10	3	0	64	2	12	10	1	0	50	Weak			
We.	3	0	8	10	7	0	94	4	9	10	2	0	65	Weak			
Reaction Rating		Mothers					Premature Infants										
Negative	0	0					3										
Weak	1+	11					9										
Moderate	2+	5					5										
Strong	3+	1					0										
Average reaction.....		1.4					1.1										

The complement fixation test has been used by several writers, with little agreement in results. Daughtry-Denmark¹⁶ found it possible to secure complete fixation of the complement after the use of adequate amounts of Sauer's vaccine. Weichsel and Douglas¹⁷ found a definite decline in complement fixation three to four weeks after the last injection, the test often giving completely negative results five to six weeks after the last injection of vaccine. Kaires and Goetze¹⁸ could not demonstrate antibodies following vaccination of nurslings but were able to secure complete fixation in infants over 1 year of age.

The opsonocytophagic test, used by Huddleston in the study of brucellosis, led Kendrick and her co-work-

and her associates, however, found that all strains of H. pertussis gave consistently comparable results.

TABLE 6.—Results of One Hundred and Eleven Opsonocytophagic Tests on Seventy-Seven Infants Prior to Vaccination

Age Group	Number of Infants Tested	Reaction Rating and Number of Infants Giving Each Reaction				
		Negative 0	Weak 1+	Moderate 2+	Strong 3+	Average Reaction
2 months of age or younger	34	5	18	11	0	1.2
2-6 months of age	77	22	48	7	0	0.8

PRESENT STUDY

In attempting to evaluate the results obtained by pertussis vaccination in a group of children, we have employed the opsonocytophagic test, because on the

15. Miller, J. J., and Silverberg, R. J.: The Agglutination Reaction in Relation to Pertussis and to Prophylactic Vaccination Against Pertussis with Description of a New Technique, *J. Immunol.* 37: 207-221 (Sept.) 1939.
16. Daughtry-Denmark, Leila: Studies in Whooping Cough, *Am. J. Dis. Child.* 52: 587 (Sept.) 1936.
17. Weichsel, M., and Douglas, H. J.: Complement Fixation Tests in Pertussis, *J. Clin. Investigation* 16: 15-22 (Jan.) 1937.
18. Kaires, A., and Goetze, S.: Immunologic Studies in Whooping Cough, *Ztschr. f. Kinderh.* 55: 501, 1933.

19. Kendrick, Pearl; Gibbs, Jean, and Sprick, Marion: The Opsonocytophagic Test in the Study of Pertussis, *J. Infect. Dis.* 60: 302-311 (May-June) 1937.

20. American Public Health Association Year Book, 1935-1936.

range from 0 to 300, and the divisions of this range determine the reaction rating as negative, weak, moderate and strong as may be seen in figures 1, 2 and 3 and in table 3.

RESULTS

In order to establish a normal figure for the unvaccinated child, tests were made on a group of 20 full term children ranging in age from 2 months to 5 years (table 4). These figures showed a low rating in all age groups, refuting the belief that the opsonocytaphagic reaction rises appreciably with increasing age for nonspecific reasons.

Tests were performed on 17 mothers and their infants at some period between the second and ninth week of life (table 5). The reaction was essentially the same in the infant as in the mother, being in all except 2 instances higher in the mother, although maintaining approximately the same degree of opsonizing power in each. This is graphically shown in figure 4, which illustrates the striking similarity between the reactions of the mothers and their offspring. These data correspond to those obtained by Bradford and Slavin.²² Kendrick, Gibbs and Sprick,¹⁰ however, reported that the blood of newborn infants has practically no phago-

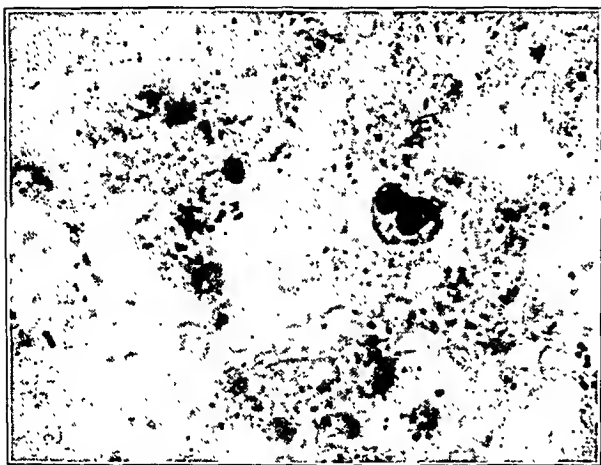


Fig. 1.—Weak reaction; section slightly reduced from a photomicrograph with a magnification of 1,080 diameters.

cytic power regardless of the opsonocytaphagic reaction of the mother. We are unable to explain this discrepancy between our data and those of Kendrick and her co-workers.

Tests were made on 77 premature infants ranging from birth to 6 months of age. These were divided into two groups, those aged 2 months or younger and those from 2 to 6 months of age. The results showed that infants up to 2 months of age give a stronger average reaction than do those in the group 2 to 6 months old (table 6). This would indicate that there is a placental transfer of circulating antibody to the baby and that this response of immunity gradually decreases after birth. It is interesting to note that in two sets of twins, aged 6 weeks, the reaction was the same in the two twins.

Table 7 shows the results of testing 3 children at given intervals before, during and for one year after inoculation. They show the general increase in opsonic index during the course of immunization, with the

highest point being reached two months after the last inoculation and a gradual decline occurring thereafter. In this regard our data closely paralleled those reported by Kendrick.¹⁹ Noteworthy is the appreciable increase in titer as early as one week after the first injection.

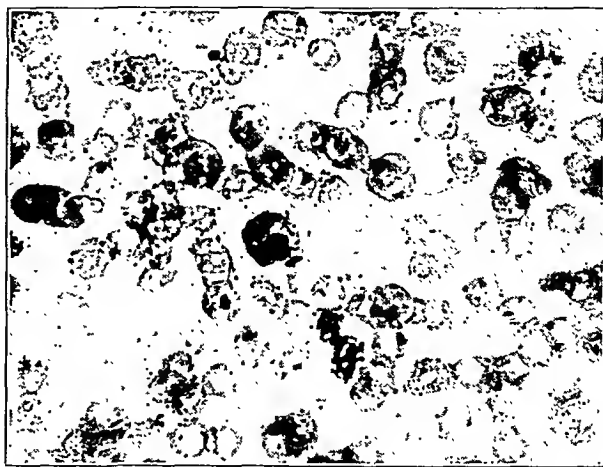


Fig. 2.—Moderate reaction; section slightly reduced from a photomicrograph with a magnification of 1,080 diameters.

Table 8 illustrates in detail the data on 1 child with the method of arriving at the estimated rating.

Summarized in table 9 and figure 5 are the opsonocytaphagic tests on a group of 260 children studied up to three years after inoculation. This is graphically demonstrated in figure 5. Thirty-five of these children, who were immunized, were 2 to 7 years old at the start of this study. Opsonocytaphagic tests taken on these 35 children from one and one-half to three years after vaccination revealed no appreciable difference in reaction from tests done at the same intervals on the 225 children vaccinated at the age of 6 months.

A review of opsonocytaphagic tests performed on these 260 children reveals interesting data with regard

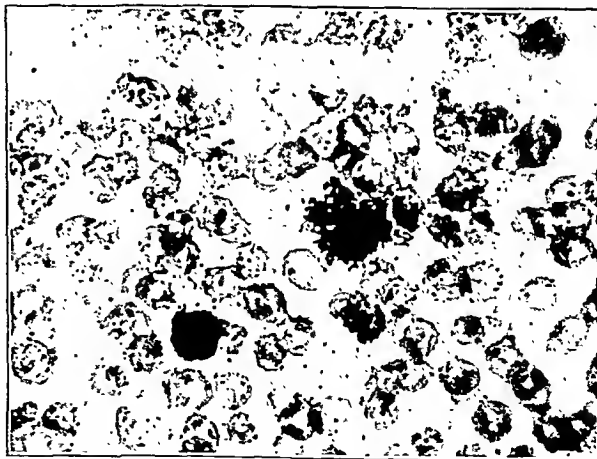


Fig. 3.—Strong reaction; section slightly reduced from a photomicrograph with a magnification of 1,080 diameters.

to a drop in reaction rating as time goes on. Thus, of 45 children tested six months after vaccination 3, or 6.6 per cent, showed a low rating; of 24 children tested one year after vaccination 5, or 20 per cent, showed a low rating; of 48 children tested eighteen months after vaccination 24, or 50 per cent, showed a low rating,

22. Bradford, W. L., and Slavin, Betty: The Opsonocytaphagic Reaction of the Blood in Pertussis, *J. Clin. Investigation* 16: 825-828 (Sept.) 1937.

and of 85 children tested two years after vaccination 49, or 57 per cent, showed a low rating.

Since a considerable drop in opsonizing power usually occurs from eighteen months to two years after vaccination, the effect of a stimulating dose of 2 cc. of *H. pertussis* vaccine given two years after vaccination (10,000 million per cubic centimeter) was studied on 42

Vaccination was accomplished in three weekly injections of 1 cc., 2 cc. and 2 cc. respectively. The response for three months, as seen in table 11, was practically identical with that obtained with the single strength vaccine as originally used.

A study of the opsonocytaphagic tests on vaccinated infants in whom pertussis subsequently developed offered interesting information (table 12). These tests, made before the onset of whooping cough, showed a weak or negative reaction in 7 and a moderate reaction in 1. These tests were made from two to six months before the onset of whooping cough, save in 1 instance in which the test was made at the onset of the disease. Pertussis developed five to twenty-one months after the inoculation of the infants. The tests in this group of infants thus offer evidence to indicate that the opsonocytaphagic test is a reliable index of immunity.

A study of opsonocytaphagic tests was made on a group of nonvaccinated children who had previously had whooping cough (table 13). These tests were made on 20 unvaccinated children who had had pertussis from three months to seven years previously. They showed a trend in opsonocytaphagic response comparable to that obtained after vaccination.

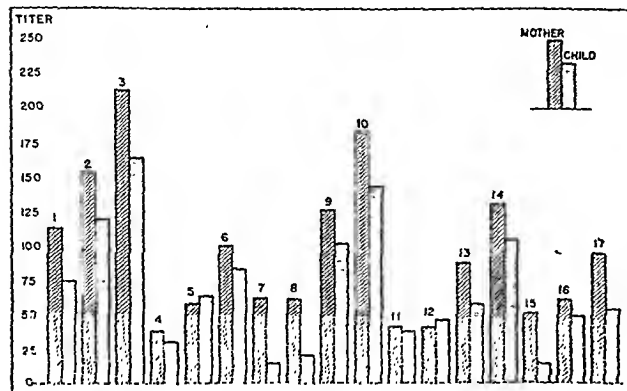


Fig. 4.—Comparison of mothers' and infants' opsonocytaphagic indexes.

children (table 10). Twenty-four of the children whose reaction rating had dropped to a low level (1.0) showed an abrupt rise in rating (2.5) when tested two months after revaccination. This rating was slightly higher than the original peak, which had been reached two months after the initial vaccination. Eight of these children were again tested nine months after reinoculation, and the rating (fig. 6) remained high (2.0). Eighteen children showed only a moderate drop in rating (1.7) before the stimulating dose was given. These children failed to respond to revaccination, their rating remaining exactly the same (1.7). This would indicate that in children whose opsonizing power has dropped to a low level a stimulating dose of vaccine is of definite value in raising the opsonocytaphagic index. In those infants in whom no appreciable drop has occurred, revaccination produces no demonstrable effect in the opsonocytaphagic index. We feel that this is probably due to the fact that immunity is already present. Figure

SUMMARY AND CONCLUSIONS

In the evaluation of immunization against pertussis as determined by clinical and immunologic studies, in

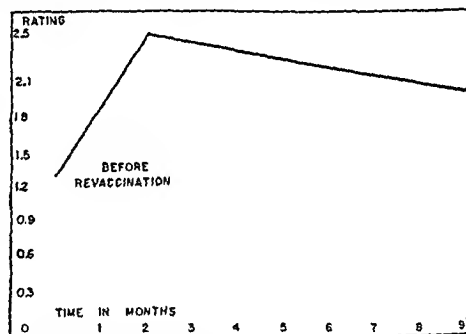


Fig. 6.—Reaction to revaccination in infants with previous low ratings.

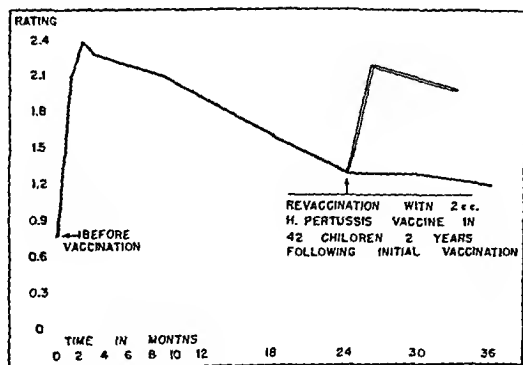


Fig. 5.—Characteristic reactions following vaccination and revaccination.

5 represents a composite of these children showing the general trend following vaccination and revaccination: the rapid rise in rating two months after vaccination, the gradual drop to a base line two years after inoculation and the rapid rise following revaccination.

The use of "double strength" (20,000 million per cubic centimeter) vaccine was studied in 16 infants.

the clinical part of the study 379 children varying in age from 6 months to 5 years were inoculated at weekly intervals with a total of 8 cc. of phase I *Haemophilus pertussis* organisms (10,000 million per cubic centimeter). Among 58 of these children there were known exposures to whooping cough with the subsequent development of 9 cases, or a case incidence of 15.5 per cent. One hundred and forty unvaccinated siblings served as the controls. Among 47 of these siblings there were known exposures to whooping cough with the development of 37 cases, or a case incidence of 78.7 per cent. Cases in the vaccinated group were, in general, milder than those in the unvaccinated control group.

These results indicate that there is a definite reduction in the incidence and severity of whooping cough following vaccination with phase I *H. pertussis* vaccine.

Of the suggested laboratory methods to determine immunity in pertussis—complement fixation, agglutination, specific cutaneous testing and the opsonocytaphagic test—the last-mentioned was chosen because it can be readily performed with a minimal amount of blood and because it appeared to offer promise of being a reliable index of immunity.

Opsonocytophagic tests were made on the following groups:

(a) Twenty full term unvaccinated children who had not had pertussis, ranging in age from 2 months to 5 years. These yielded consistently low reaction ratings.

(b) Twenty prematurely born, unvaccinated children who had previously had whooping cough from less than

TABLE 11.—Summary of Opsonocytophagic Tests on Sixteen Children Injected with Double-Strength (Twenty Billion Cc.) Vaccine

Test Interval	Number of Children Tested	Reaction Rating and Number of Children Giving Each Reaction				Average Reaction
		Negative 0	Weak 1+	Moderate 2+	Strong 3+	
Time of first injection.....	16	2	13	1	0	0.9
One month after vaccination.....	6	0	1	4	1	2.0
Two months after vaccination.....	9	0	0	5	4	2.5
Three months after vaccination.....	5	0	1	2	2	2.2

six months to seven years before. These yielded high reaction ratings. The strength of the reaction varied directly with the time that had elapsed since the occurrence of the disease.

(c) Seventeen mothers and their 2 to 9 week old infants. These tests showed a striking similarity of rating. When the mother's rating was strong, the infant's was strong, and vice versa. This would indicate that there may be a placental transference of antibodies.

(d) Thirty-four unvaccinated infants ranging in age from 10 days to 2 months and 77 unvaccinated infants ranging in age from 2 to 6 months. A comparison of these groups showed a higher average reaction rating for the group of infants under 2 months of age. This would indicate a gradual loss of antibodies following birth.

(e) Two hundred and twenty-five children who received 8 cc. of phase I H. pertussis vaccine at the age of 6 months. Repeated tests showed a characteristic curve. Some immediate response was already present one week after the first injection. This increased after each subsequent injection, reaching a peak two months

TABLE 12.—Opsonocytophagic Tests Made on Patients in Whom Pertussis Developed After Vaccination

Patient	Age of Patient when Test Was Made	Time Interval Between Making of Test and Onset of Pertussis	Reaction	Titer
1.....	Not tested			
2.....	3 yr. 6 mo.	6 mo.	Weak	64
3.....	10 mo.	6 mo.	Moderate	118
4.....	13 mo.	5 mo.	Weak	78
5.....	12 mo.	Onset of disease	Weak	70
6.....	21 mo.	2 mo.	Weak	42
7.....	5 yr. 8 mo.	2 mo.	Weak	43
8.....	5 yr. 8 mo.	2 mo.	Negative	15
9.....	2 yr. 6 mo.	3 mo.	Weak	83

after the last injection. The curve then gradually declined to a base line level at least until three years after inoculation.

(f) Thirty-five children ranging in age from 2 to 7 years who were vaccinated with the same dose that was given to the infants who were 6 months of age. They showed the identical reaction curve that was present in the younger group.

(g) Forty-two prematurely born children two years after vaccination. In 24 of these children the reaction rating had dropped to a low level, and in 18 the rating remained at a moderate degree. These 42 children were then given a stimulating dose of 2 cc. (10,000 million per cubic centimeter) of phase I. H. pertussis vaccine. Tests were made two months after the stimulating dose. These tests showed that in the 24 children whose ratings had dropped to a low level there was an increase in rating to a level slightly higher than the original peak, which had been reached two months after the first series of inoculations. Eight of these infants who were again tested nine months after the stimulating dose still retained a high rating. In the 18 children whose ratings remained at a moderate degree, revaccination elicited no response. This probably indicates that immunity was already present in the latter group.

(h) Sixteen infants aged 6 months on whom double strength vaccine (20,000 million per cubic centimeter) was used. Tests on these infants revealed essentially the same reaction curve during the first three months after inoculation as that obtained after the use of single strength vaccine. Tests in this group were made for only two months after vaccination.

(i) Eight children out of a group of 9 who were vaccinated five to twenty-one months before contracting

TABLE 13.—Opsonocytophagic Tests at Intervals Following an Attack of Pertussis

Test Interval	Number of Children Tested	Reaction Rating and Number of Children Giving Each Reaction				Average Reaction
		Negative 0	Weak 1+	Moderate 2+	Strong 3+	
Less than six months after attack.....	6	0	1	3	2	2.2
Six months to two years after attack.....	8	0	3	4	1	1.75
Two years to seven years after attack.....	6	1	3	2	0	1.2

whooping cough. These tests made before the onset of whooping cough showed a weak or negative reaction in 7 infants and a moderate reaction in 1 infant. This appears to indicate that the opsonocytophagic test is a reliable index of immunity to pertussis, since the overwhelming majority of infants who contracted the disease showed a lower rating before the onset of pertussis.

We believe that this study indicates from both a clinical and an immunologic standpoint that pertussis vaccination is of definite value in reducing the incidence of whooping cough, that revaccination two years after the original inoculation is a desirable procedure and that the opsonocytophagic test is a reliable index of immunity.

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Blood Volume.—The volume of the blood in normal subjects is 70 to 100 cc. per Kg. body weight; that of the plasma is 40 to 60 cc. per Kg. Probably the volumes are more closely related to surface area; per square meter of body surface the volume of the blood is 2,500 to 4,000 cc. and of the plasma 1,400 to 2,500 cc. Roughly speaking, the total blood volume is one eleventh of the body weight, or about 6 liters in an average adult. It must be remembered that in the splenic pulp there is a considerable store of red cells (probably smaller in man than in certain lower animals) which do not circulate normally but may be delivered into the blood stream in time of need.—Wright, Samson: Applied Physiology, New York, Oxford University Press, 1940.

CADMIUM "FOOD POISONING"

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AND

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NEW YORK

In recent years cases of gastroenteritis in groups, designated for want of a better term as food poisoning, have been much more thoroughly investigated, and as a result the distinctive characteristics peculiar to various individual etiologic factors have been more clearly defined. For example, the description of the symptoms of staphylococcal food poisoning almost invariably follows a definite pattern, and as a result the experienced investigator often suspects the condition long before the final confirmatory bacteriologic report is completed.

A similar situation exists in the case of acute poisoning with cadmium, a characteristic type of gastritis caused by the accidental contamination of certain food and drink with soluble cadmium compounds. In our experience the history of the preparation of the food or drink and the clinical pictures are so similar in all outbreaks that the diagnosis is evident once the condition is thought of and the pertinent facts have been ascertained. The following four outbreaks occurring in New York during the past three years and definitely traced to poisoning with cadmium are illustrative of this syndrome. There is little doubt in our minds that other outbreaks have occurred but have not been brought to the attention of the department of health.

REPORT OF FOUR OUTBREAKS

FIRST OUTBREAK.¹—On June 15, 1937 at 1:15 p. m., 3 members of a family, 1 adult and 2 children, drank cold "lemonade" made from a flavored, yellow crystalline powder. Fifteen minutes later all 3 became ill with nausea, abdominal pains and vomiting. Three other members of the family who had eaten the same food as the first three but did not drink the "lemonade" remained well. The patients recovered completely within twenty-four hours.

The colored powder was essentially a mixture of tartaric acid, sugar, lemon flavor and a certified coal tar dye. Chemical examination of the "lemonade" and of the flavored crystals from which it had been made showed 0.3 mg. of cadmium present in the liquid per gram (300 parts per million) but no cadmium in the original concentrated crystals. It was determined that the drink had been made by dissolving the crystals with tap water in a glass bowl. This mixture was stirred with a wooden spoon and poured for cooling into one of the ice cube trays of an electric refrigerator. The tray and divider on examination were found to be cadmium plated. This refrigerator had been used by the family for twelve years but had never before been utilized for the purpose of cooling an acid mixture. How the tray became cadmium plated could not be determined; the manufacturer, one of the largest in the industry, stated that cadmium never had been used as a plating material.

SECOND OUTBREAK.—On June 29, 1938 7 persons, 5 adults and 2 children, members of three separate neighboring families, became ill within half an hour of drinking home made punch. They had consumed no other food or drink in common. The symptoms were nausea, abdominal cramps and weakness.

The drink had been prepared from a fruit-flavored punch syrup, the juice of two lemons and two oranges and tap water.

From the City of New York Department of Health.

Mr. Kleeman is now instructor in food science at the Food Trades Vocational High School.

Jerome B. Trichter, director, and Herman Erde, assistant director, and the inspectorial and chemical forces of the Bureau of Food and Drugs of the department of health made the investigations and analyses of the outbreaks described.

1. Pensa, A. J.: An Unusual Case of Food Poisoning, *Food Inspection* 4:5 (March) 1938.

To cool the mixture, ice cubes taken from a metal refrigerator tray of the electric ice box in the home were placed in the punch, which stood in a glass pitcher.

In the routine investigation, the following samples were examined: prepared punch, ice cubes, fruit syrup, tap water, the spoon and the refrigerator tray. Cadmium was found present in the prepared punch, 0.067 mg. per gram (67 parts per million); in the ice cubes, 19 and 8 parts per million (two separate samples), and in the plating of the refrigerator tray, which was found to be coated with the metal cadmium. No cadmium was found in the syrup concentrate or in the tap water taken from the home.

Questioning disclosed that on the afternoon of the day in question there had been a leak of the refrigerant, sulfur dioxide. After the leak had been repaired, the water in the tray had been replaced with fresh water, which was then frozen into the ice cubes used in cooling the punch. The sulfur dioxide dissolved in the water to give sulfurous acid, which reacted with the cadmium to give cadmium sulfite. It was also determined that the electric refrigerator had been bought at second hand, but we could not trace where and under what circumstances the replating of the ice cube trays with cadmium had occurred. In this instance too the manufacturer stated that the trays originally had contained no cadmium, aluminum being the only metal used.

THIRD OUTBREAK.—On Jan. 7, 1940 5 persons in one family, 2 adults and 3 children, became ill after a dinner served at about 1:30 p. m. Within fifteen minutes several members were attacked with nausea, abdominal cramps, vomiting and diarrhea, and within one hour all were similarly affected.

Suspicion was immediately directed to the dessert, a raspberry gelatin mixture. This had been prepared the same morning by mixing the contents of a $\frac{3}{4}$ ounce (21.2 Gm.) package of a widely distributed gelatin powder with 2 cups of boiling water, permitting the mixture to cool and then transferring it to a metal ice tray in the electric refrigerator. The congealed mixture remained in the tray for three hours before it was served. The original gelatin powder contained added citric and tartaric acids.

A sample of the remaining gelatin dessert was reported as containing 0.53 mg. per gram (530 parts per million) of cadmium. The metal freezing tray was found to be cadmium plated. The refrigerator in this case had also been purchased at second hand about three years previously, and the manufacturing company disclaimed equipping it when new with cadmium-plated trays. It was impossible to trace the recycler and so determine under what circumstances the trays had been cadmium plated.

FOURTH OUTBREAK.—On July 11, 1940 6 persons, 2 members of a family and their 4 guests, 2 adults and 4 children, became ill with vomiting and cramps within ten minutes after drinking iced tea. The guests had not previously had any food or drink in common with the family.

The tea was prepared as follows: The juice of three lemons was squeezed into a metal pitcher, boiling water was then added and tea balls were steeped in the solution. The mixture was allowed to cool in the pitcher for one hour before ice cubes were added. A sample of the iced tea was found to contain 0.16 mg. per gram (160 parts per million) of cadmium. The freezing tray in this case was found to be free from cadmium, but the metal pitcher used in the preparation of the tea was discovered to be plated on the inside with cadmium. Although this pitcher had been in the family for eight years, at no previous time had it ever been used for any acid drink. The pitcher was traced by means of its identification stamp to a local manufacturer, who, however, denied ever using cadmium as a plating metal. Similar sample pitchers taken from his plant did not contain cadmium.

In addition to these four outbreaks, the records² of the department of health contain details of the illness of at least 29 school children in three boroughs of the city who were reported as having violent nausea during

2. Miller, R., and MacNeil, R. L.: Personal communications to the authors.

the first week of May 1929. After five or six hours all the children recovered completely. In the investigation of these illnesses a history was obtained from the children that popsicles (flavored ices frozen on a stick) had been eaten just previously to the children's becoming ill. Samples of the popsicles were collected and examined in the chemical laboratory of the department. They were found to contain between 0.013 and 0.015 mg. per gram (13 to 15 parts per million) of cadmium. Further investigation indicated a common source for the popsicles, and complete studies were therefore made at the manufacturing plant. The popsicle mixture, containing fruit acids, coloring material, sugar and water, was found to be free from cadmium before freezing, and only in the finished product after its removal from the molds did the cadmium appear. Examination of the popsicle molds themselves revealed them to be plated with cadmium. Further investigation disclosed that the molds in question had been lent by the manufacturer to another popsicle plant and that before their return the surface of the molds had been found to be so worn that they had been replated, cadmium being used as the replating metal.

The molds and all the finished food products in the plant were seized, and no further operations were permitted with any cadmium-plated molds.

THE SYNDROME

There have thus come to our attention five outbreaks involving at least 50 persons attacked with a similar complaint. This appears as violent, acute gastritis which occurs almost immediately after ingestion of a liquid or a readily dissolved solid of acid nature containing a soluble cadmium compound. It apparently attacks everybody who partakes of the contaminated food, in contrast to those types of bacterial food poisoning due to salmonella or toxic filtrates formed by organisms such as staphylococci in which some persons are affected at varying intervals of time while others may escape the illness completely.

Acute poisoning with cadmium is similar to acute poisoning with soluble compounds of zinc, and while there were no fatalities in our cases or in any in the literature reported as due to the ingestion of cadmium compounds, there are several instances in which exposure by inhalation to cadmium fumes in industrial activities has resulted fatally. Autopsy in 1 such case reported by Legge³ revealed congestion of the respiratory and intestinal tracts, fatty infiltration of the heart and liver, hemorrhagic inflammation of the spleen and acute inflammation of the kidneys.

Chronic poisoning due to continued ingestion of minute amounts of cadmium compounds has never been reported, nor is there any great likelihood that such a condition is at all prevalent, since the immediate, violent, emetic action results in the elimination of most of the poison. In industry, however, with constant exposure by inhalation, cases of chronic poisoning have been recorded in which the symptoms were digestive disturbances, loss of appetite, vomiting and cachexia.

The experimental evidence for the development of chronic poisoning with cadmium in animals is at present incomplete, several investigators finding no true storage of the metal in the tissues of experimental animals, while others hold that this may occur.⁴

CHEMICAL ASPECTS

Cadmium is a ductile metal of bluish white appearance with an atomic weight of 112.41 and a melting point of 320.9 C. It is capable of taking a high polish; on this is based its rapid rise in industry as a plating metal for rustproofing. It was first used as a coating for strings on pianos and other musical instruments, but now it has been adopted as a coating for many motor vehicle parts because of its relatively high melting point and resistance to wear.

Cadmium is insoluble in water and closely resembles zinc in its chemical reactions, being nearly always found associated with zinc ores in relatively small quantities. In these ores cadmium is present, together with zinc sulfide, zinc carbonate and zinc silicate, as cadmium sulfate, cadmium carbonate and cadmium silicate. The cadmium content of zinc ores varies generally from 0.1 to 0.5 per cent; occasionally some ores are found which contain from 2 to 5 per cent. The pure metal is obtained as a by-product in the distillation of zinc. When cadmium is heated in air it burns readily, evolving brown fumes of cadmium oxide. The most important compounds of cadmium are the oxide, sulfate, sulfide, chloride, iodide and bromide.

The importance of cadmium from the medical standpoint derives from its solubility in acids. The cadmium metallic coating on utensils used for food dissolves when in contact with solutions containing as little as 0.5 to 2.5 per cent of acetic acid. Cadmium is also soluble in other organic acids commonly found in foods, such as citric, tartaric, malic and lactic acids, even though the concentrations of these may be small. With all these, organic cadmium salts are formed. These salts, when taken internally, combine with the hydrochloric acid of the gastric juice to produce poisonous cadmium chloride.

Cadmium is readily detected in food or vomitus. The wet ash solution should be neutralized and made slightly acid, and then hydrogen sulfide should be passed in. Yellow cadmium sulfide is precipitated.⁵

TOXICOLOGY

Cadmium presents its greatest hazard to the health of man during its production and in the handling of its compounds. Most dangerous are the inhalation of fumes and vapors arising from retorts or condensers while cadmium and cadmium oxide are being manufactured and the inhalation of dust in bagging and handling the materials.

The syndrome arising from the ingestion of cadmium compounds was studied in animals by Schwartz and Alsberg in 1923.⁶ They fed cats cadmium chloride in raw, hashed, lean meat, in fish juice and in meat extract. It was more toxic in dilute solutions than in concentrated solutions. The consumption of an average-sized meal of raw, hashed meat containing 350 to 400 parts per million of cadmium was almost always followed by emesis. In experiments on continued feeding, concentrations of 250 or more parts per million were fatal; there was no evidence of cumulative systemic action. There was no storage other than in the kidneys, the liver and the spleen.

Schwarz and Otto⁷ fed cadmium carbonate to cats in amounts varying from 1 mg. to 11 mg. per kilogram

3. Legge, T. M.: Cadmium Poisoning, in Annual Report of Chief Inspector of Factories for 1923, London, His Majesty's Stationery Office, 1924, p. 74; cited by Prodan.⁴

4. Prodan, L.: Cadmium Poisoning: I. The History of Cadmium Poisoning and Uses of Cadmium, J. Indust. Hyg. 14: 132 (April) 1932.

5. Jacobs, M. B.: The Chemical Analysis of Food and Food Products, New York, D. Van Nostrand Company, Inc., 1938, p. 141.

6. Schwartz, E. W., and Alsberg, C. L.: Studies on the Pharmacology of Cadmium and Zinc with Particular Reference to Emesis, J. Pharmacol. & Exper. Therap. 21: 1 (Feb.) 1923.

7. Schwarz, L., and Otto, A.: Is Cadmium an Industrial Poison? Ztschr. f. Hyg. u. Infektionskr. 104: 364, 1925.

of body weight for periods of two months. These animals showed more or less pronounced loss of weight, sometimes followed by death. Some showed a decrease of from 10 to 20 per cent in the hemoglobin content, a decrease in the red cell count and an increase in the number of leukocytes, especially the polymorphonuclear leukocytes.

Prodan⁸ in 1932 investigated the pathologic changes observed microscopically in poisoning by food and also determined the distribution of cadmium in the body. The poisoning was produced by feeding cats cadmium carbonate and cadmium phosphate. No difference was noted in the action of the two salts. Cadmium fed in large doses (200 mg.) induced vomiting with salivation and loss of appetite. Vomiting also occurred for a short period following medium (10 mg.) doses but was absent after small doses (2 mg.). The vomiting and the loss of appetite were followed by loss of body weight.

Prodan found further that, irrespective of the dose of cadmium fed, the liver and kidneys were affected. The liver was found to reveal changes varying from general granulation of the cells to pronounced fatty infiltration, especially around the central vein. The kidneys showed a fatty infiltration which was more prominent in the convoluted tubules. Cadmium was retained in the liver in greater absolute quantity and in the kidneys in greater relative quantity. The bones also retained a high percentage. Cadmium was excreted slowly through the kidneys and the gastrointestinal tract. No definite changes were found in the blood.

PREVIOUS OUTBREAKS

There is little in the literature concerning poisoning by the ingestion of cadmium and its compounds. The first reported cases of cadmium poisoning from oral ingestion in human beings were noted by Wheeler⁹ in 1876. In his 2 cases, cadmium bromide had been taken orally for medicinal purposes instead of ammonium bromide, the bottle having been wrongly labeled at the factory. In these cases the symptoms were an extremely pungent taste, severe vomiting, complaint of a burning sensation in the stomach and diarrhea. The vomiting and diarrhea lasted fully five hours, during part of which the pulse was imperceptible. The quantity taken was not estimated.

It was not until 1928, some fifty years later, that further mention was made of poisoning from the ingestion of cadmium. An outbreak of illness apparently caused by cadmium-plated utensils was reported by the Los Angeles station of the United States Department of Agriculture in November 1928.¹⁰ In this outbreak a manufacturer of fruit juice products delivered three 5 gallon (19 liter) cans of a combination of fruit juices to a fraternity house, a grade school and a city high school. A number of persons became sick with nausea and diarrhea almost immediately after they had partaken of the beverage. The city chemist secured samples of the product. Analyses indicated the presence of cadmium salts in fairly large amounts. Investigation at the plant showed that the manufacturer, in search of a container that would not corrode, had had the cans for the fruit juice products plated with cadmium by a local concern. These cans showed streaks of corrosion on examination. They were said to have been used only a few times previous to the outbreak.

In 1934 C. R. Hazen¹¹ reported the illnesses of 3 women who ate a gelatin mixture. The circumstances surrounding these cases were almost exactly similar to those in outbreak 3 of our series. Two ladies had made a dessert with a lemon gelatin dessert powder and poured it into an ice cube pan in their apartment refrigerator to obtain a firm, cold jelly. They ate part of this dessert during the evening meal. In a short time both became ill. Violent vomiting followed by diarrhea of a watery character and dryness of the mouth and throat were the most noticeable symptoms. The remainder of the jelly was left in the pan until the next day. By this time the two ladies had recovered. Meanwhile, not suspecting the jelly, they gave some to their charwoman for her lunch. She, too, became violently ill, manifesting the same symptoms, and was sick for a week. It was then that the jelly was suspected and the trays in which the jelly had been set were taken to an analyst. The coating on the trays was found to consist of a metallic alloy containing more than 50 per cent cadmium.

The only other references relating to the ingestion of cadmium are two abstracts of papers not available, one by Griebel and Weiss¹² and the other by Larsson.¹³ In the first of these a typical case of cadmium poisoning is reported caused by ingestion of coffee prepared in a factory. The kettle in which the coffee was brewed had previously been treated with hydrochloric acid containing a cadmium salt. Some of the cadmium had remained in the kettle.

In the other, several persons in Sweden were reported to have had serious symptoms of poisoning after eating food prepared in a cast iron roasting pan. Examination showed a white coating of cadmium on the pan. This type of pan had been manufactured from ordinary cast iron and electrolytically plated with cadmium.

COMMENT

The importance of recognition of the syndrome which has been described is of course manifest. Any way by which the various types of food poisoning may be subdivided so that the responsible agent may be readily and quickly ascertained is of great value, since prevention of further spread is thereby attained. In the case of acute poisoning with cadmium, knowledge of the previous history of the syndrome will enable the wide awake investigator to spot the similarity between the outbreak he may be investigating and those herein described. It is obvious that once attention is called to the possibility of acute poisoning with cadmium it can readily be detected almost from a mere description of the type of outbreak.

A far more important result of the knowledge that acute poisoning with cadmium compounds can occur, and in fact does occur, is the necessity for taking definite steps toward the prevention of further outbreaks. These should be as follows:

1. No utensils to be used in the preparation or dispensing of food or drink should be permitted to be plated with cadmium. In every basic state and municipal public health law relating to the manufacture and preparation of food there should be a provision for this control. In addition, in order to provide full protection throughout the country, there should be federal regulations prohibiting this practice in interstate commerce.

11. Hazen, C. R.: Cadmium is Poisonous, *Food Industries* 6: 269 (June) 1934.

12. Griebel, C., and Weiss, F.: Intoxication by Cadmium-Containing Coffee, *Pharm. Zentralhalle* 72: 689, 1931; abstracted, *Chem. Abstr.* 26: 1659 (March 20) 1932.

13. Larsson, R.: A Case of Cadmium Poisoning of Human Beings, *Samml. Vergiftungsfall.* 7: 33 (part A), 1936; abstracted, *Chem. Abstr.* 31: 7535 (Oct. 20) 1937.

8. Prodan, L.: Cadmium Poisoning: II. Experimental Cadmium Poisoning, *J. Indust. Hyg.* 14: 174 (May) 1932.

9. Wheeler, G. A.: A Case of Poisoning by Bromide of Cadmium, *Boston M. & S. J.* 95: 434 (Oct. 12) 1876.

10. Food, Drug & Insecticide Rev. 12: 26 (Nov.) 1928.

2. Health officers and manufacturers of utensils for food should be made cognizant of the syndrome of poisoning with cadmium and the necessity for restricting the use of this material. It is especially important today that the plating industry, searching for substitutes for tin and other valuable war materials, be cautioned that cadmium is not a suitable substitute in the plating of utensils for food. New York City has already taken these steps. The plating industry was called into conference and advised to discontinue the use of cadmium in utensils and dispensers for food. Subsequently, the sanitary code, which deals with all measures concerning the health of the citizens of the city, was amended to prohibit the use of cadmium in articles used in the preparation of food and drink.¹⁴

SUMMARY

In the five outbreaks of acute poisoning with cadmium here reported, involving approximately 50 persons, the syndrome was characterized by violent acute gastritis occurring almost immediately after the ingestion of the contaminated food. A typical outbreak may be detected with ease if the characteristics of the syndrome are kept clearly in mind. The association of immediate food poisoning of groups with the ingestion of an acid liquid prepared in a metal container should cause suspicion, and an immediate investigation for the presence of cadmium-plated utensils should be made.

125 Worth Street.

THE ASSOCIATION OF BACILLARY DYSENTERY AND INFEC- TIOUS JAUNDICE

WITH SPECIAL REFERENCE TO EPIDEMIOLOGY AND
BACTERIOLOGIC CONTROL

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The association of bacillary dysentery and infectious jaundice in simultaneous epidemics is not a common occurrence. A survey of the literature reveals no mention of such a coincidence, although private conversations with general practitioners in Vermont have uncovered reports of minor seasonal (usually autumnal) epidemics of diarrhea with mild jaundice. Bacillary dysentery is a well known cause of serious epidemics of diarrheal disease in institutions, army camps and other places in which large numbers of persons exist in crowded, unsanitary conditions.

Late in October 1939, major outbreaks of diarrheal disease and infectious jaundice occurred at the Brandon State School, which is an institution of three hundred and eighty bed capacity caring for persons with mental deficiency in Vermont. During the period from October 1939 to July 1940, during which new cases were constantly appearing, the combined epidemics presented three distinct phases. The patients who contracted the disease early (October 17 to November 15) showed nausea, vomiting, abdominal cramps and diarrhea and were treated symptomatically as having seasonal digestive upsets until subsequent bacteriologic studies established the diagnosis of bacillary dysentery (Flexner type). The second phase was characterized by a group of cases in which the symptoms of dysentery were complicated by the appearance of jaundice about one week

after the acute onset of the diarrheal disease. The third phase involved a group of cases presenting symptoms of infectious jaundice alone. The chronologic relationships in the combined epidemics are presented in table 1. The different groups of cases have been classified according to clinical symptoms alone.

The first cases of dysentery occurred in dormitory D, which houses 60 boys of low grade mentality. The early cases occurred in a group of older boys who had good resistance, and the disease was mild in intensity. On October 29, twelve days after the first case appeared, acute vomiting and diarrhea developed in a group of younger children, but the extent of their dehydration did not become obvious until the sudden fatal collapse of 2 young low grade idiots on November 1. Isolation precautions were immediately instituted when it was recognized that the epidemic was more serious than ordinary seasonal digestive disturbances. In spite of precautionary measures, the epidemic continued unabated in dormitory D, and isolated cases began to appear in other dormitories. From October 17 to November 5, a total of 46 cases of dysentery and/or jaundice appeared among the 58 inmates of dormitory D. In addition, 6 nurses and attendants in this building contracted one or both diseases during the epidemic. On November 6, the first case of diarrhea occurred in dormitory E (which houses older, brighter girls) and 9 other cases were reported up to March 1. On November 13, the first case was reported in dormitory A (for low grade girls), and 21 other cases occurred among 70 inmates up to April 1. On February 9 the first of 3 cases occurred in dormitory B (which houses high grade older boys). On February 11, the first of 20 cases appeared in dormitory C (which houses high grade younger girls), and on March 19, the first of 15 cases occurred in dormitory F (housing high grade younger boys). In all, a total of 120 inmates and employees, or 35 per cent of the entire school population, presented objective symptoms during the epidemics. In table 2 is presented the distribution of cases according to clinical diagnoses in the various dormitories.

It will be noted that symptoms of dysentery predominated in dormitory D, dysentery and jaundice were seen in dormitories E and A, and jaundice alone in dormitories B, C and F. The incidence of infectious jaundice became more pronounced as the bacillary dysentery became attenuated.

SYMPTOMS

During the course of the epidemics there was a definite change from symptoms more suggestive of dysentery to symptoms more suggestive of infectious jaundice. In dormitory D, 44 of 46 patients had symptoms of dysentery (nausea, cramps, vomiting and diarrhea); 15 of this group had jaundice, usually about seven days after the onset of symptoms of dysentery; 2 patients had jaundice as the only symptom. In dormitory A (in which the epidemic started approximately at the time that the epidemic in D ended), 1 patient had symptoms of dysentery alone, 9 had symptoms of dysentery and jaundice and 12 had jaundice alone. In dormitories E, C, B and F, which house the higher grade children with better health and resistance, there were no patients with symptoms of dysentery alone, 12 with symptoms of dysentery and jaundice and 26 with jaundice alone.

There were several suggestive clinical manifestations pointing to a common origin of the two conditions. It seems significant that 26 patients (21 inmates and 5 employees) showed a definite progression from symp-

14. Sanitary Code, City of New York, Sect. 145.

toms of dysentery to jaundice. The jaundice typically appeared in each case from five to ten days after the onset of acute diarrhea. The child first had nausea and cramps, followed by vomiting and diarrhea lasting two to six days. One or two days after the diarrhea had been controlled, jaundice would appear. In some cases the jaundice was slight and transient. In 9 cases the jaundice was severe, clay stools were noted and the icterus lasted several weeks. No laboratory investigations of the icterus were conducted because of the absence of local facilities and the refusal of community hospitals to admit a patient with an infectious disease for purposes of research. The cases of more severe jaundice were associated with variable epigastric discomfort and occasional vomiting but no diarrhea.

Physical examinations gave essentially negative results throughout the epidemics except for vague epigastric or diffuse abdominal pain and tenderness. Hepatomegaly and splenomegaly were not encountered. Bloody stools were observed in 7 cases and were of grave prognostic importance. Three deaths occurred in this group; the patients were low grade idiots who became dehydrated rapidly and died of circulatory failure. Two other children died of complications following acute attacks of dysentery. In 1 progressive intestinal obstruction developed, and autopsy revealed a partial ileal obstruction from adhesions from an old undiagnosed perforation of the appendix. In this case, the edema of the ileum associated with the acute dysentery caused an obstruction from adhesions which were normally insignificant. In another child complicating empyema with bronchopneumonia developed during the most acute stage of jaundice.

Relapses of the symptoms of dysentery occurred in 14 cases; particularly when the patient was allowed out of bed too early. In some instances the relapses occurred simultaneously with the onset of jaundice; and in other cases without jaundice.

TABLE 1.—*Chronologic Relationships Existing Between the Appearance of Cases of Bacillary Dysentery and Infectious Jaundice in Combined Epidemics at the Brandon State School, October 1939 to July 1940*

Dates	Classification of Symptoms		
	Dysentery Alone	Dysentery with Jaundice	Jaundice Alone
Oct. 17 to Oct. 31.....	11	7	0
Nov. 1 to Nov. 15.....	15	9	1
Nov. 16 to Nov. 30.....	5	4	3
Dec. 1 to Dec. 15.....	1	1	1
Dec. 16 to Dec. 31.....	0	1	0
Jan. 1 to Jan. 15.....	0	0	1
Jan. 16 to Jan. 31.....	0	0	0
Feb. 1 to Feb. 15.....	0	0	8
Feb. 16 to Feb. 29.....	0	0	1
March 1 to March 15.....	0	1	18
March 16 to March 31.....	0	3	8
April 1 to July 10.....	0	0	21
Total cases.....	32	26	62

BACTERIOLOGIC INVESTIGATIONS

On November 2, immediately after the first fatality occurred, specimens of the stools in the most acute cases were obtained and examined by the Vermont State Laboratories of Health. These specimens were plated out on eosin-methylene blue and transferred to Russell's slants. Fortunately, the first 2 specimens had been obtained from patients with massive (later fatal) infections, and the Flexner type of dysentery organism

was isolated. This finding was checked by the New York State Health Laboratories by the agglutination method. During December and January, 90 other cases were bacteriologically investigated with the same culture mediums, but the dysentery organism was not isolated from any of the specimens.

TABLE 2.—*Distribution of Cases According to Dormitory and Clinical Classification in Combined Epidemics of Bacillary Dysentery and Infectious Jaundice, October 1939 to July 1940*

Symptoms	Dormitories					
	D	E	A	B	C	F
Dysentery alone.....	29	2	1	..	..	..
Dysentery and jaundice.....	15	1	5	..	..	..
Jaundice alone.....	2	7	15	3	20	15

Because of failure to control the epidemics more effectively and in order to obtain advice concerning bacteriologic methods, the aid of the United States Public Health Service was enlisted in February. Dr. A. V. Hardy, of the Division of Domestic Quarantine, visited the school, and under his supervision stool specimens from the entire school population were cultured with desoxycholate citrate agar. Between March and September 1940, eight series of stool specimens have been cultured with the improved medium. These series include all the inmates whose stools had ever been positive for the Flexner organism. The entire school population was examined twice; two series of plates were made on the inmates of dormitories A and D, and four follow-up series were taken on all inmates demonstrated to be bacteriologically positive. In table 3 are summarized the results of the stool examinations performed on all patients who were bacteriologically positive at any time during the investigation. Considerable variation was noted in the constancy of output of dysentery organisms in the stool specimens. Dysentery organisms were found more constantly in symptom-free carriers than in patients with acute dysentery. Patient F. W. was bacteriologically positive, as judged by seven different specimens taken between March and July, the eighth specimen, taken in September, being negative. The stools of other children intermittently gave positive reactions over the period of five months. The data indicate that the carrier state persists for weeks or months and can be followed only through repeated bacteriologic examinations.

In table 4 is presented the relationship between clinical symptoms and bacteriologic data. Five of the 32 patients showing symptoms of dysentery alone had stools bacteriologically positive for the Flexner organism, as did 2 of 35 patients with symptoms of dysentery and jaundice and 5 of 54 with jaundice alone. Two hundred and twenty children had no clinical symptoms, but 14 had positive stool specimens. These data suggest that there were many patients with subclinical dysentery who might have acted as carriers until they were isolated after the bacteriologic examinations. No percentages have been calculated because no accurate bacteriologic studies are available for the early portion of the epidemics.

EPIDEMIOLOGY

The circumstances introducing the epidemics to the school are incompletely understood. The first recognized case of diarrhea occurred in a low grade idiot who had been taken out by his family for a picnic at Lake Dunmore two days previously. His mother

stated that no one else was taken ill and that the boy had no appetite and appeared ill the day of the picnic. The state board of health investigated this family and found no evidence of recent diarrheal disease. An alternative theory is that the disease was introduced by the carrier W. H. This boy was admitted to the school on Aug. 31, 1939 and was demonstrated to be a symptom-free carrier in five of the eight series of bacteriologic examinations. Records indicate that this boy had been assigned as kitchen assistant shortly after his arrival. Examinations of the water and milk supply have given consistently negative results.

Control of the spread of diarrheal disease is particularly difficult in overcrowded institutions for persons with mental deficiencies. More than 50 per cent of the children in the low grade dormitories are incontinent and are cared for by older inmates. During the first two weeks the epidemic of dysentery spread rapidly, in spite of individual isolation of each new case as it appeared. Standard aseptic technic was maintained by nurses and attendants, but it was impossible to keep the inmates from contaminating one another.

After consultation with the state board of health, the children in each dormitory were divided into three groups which were rigorously isolated. One group included those acutely ill, the second consisted of recovered patients and the third group was made up of the remaining children who were symptom free. All clothing, eating utensils, floors, walls, door handles and other articles were soaked in cresol solutions. Every one was required to wash his hands thoroughly after using the toilet and before meals. Nurses and attendants wore

central kitchen. After the epidemic had spread rapidly among the low grade children it seemed to lose its virulence among the older inmates with better health and resistance. The most effective preventive methods are rigid cleanliness, disinfection of contaminated articles and measures designed to prevent hand to mouth contamination.

TABLE 4.—Number of Patients Bacteriologically Positive for the Flexner Type of Dysentery Organism Classified According to Type of Symptoms Shown

Clinical Symptoms	Number of Patients	Bacteriologically Positive
Dysentery alone.....	32	5
Dysentery and jaundice.....	35	2
Jaundice alone.....	54	5
No symptoms.....	220	14

COMMENT

The medical application of the law of parsimony requires that the existence of two separate diseases should not be postulated if all the symptoms and signs can be explained through the postulation of a single pathologic process. Although bacillary dysentery is a well known tropical disease, it has been only recently that its high prevalence in northern United States has been suggested. Seasonal epidemics of diarrhea in northern New England are common, and reports of dysentery date back to the Revolutionary War, when the disease was a dreaded scourge. Epidemic jaundice is a common yet poorly understood entity whose cause has not been definitely demonstrated.

The circumstances of simultaneous epidemics of bacillary dysentery and infectious jaundice at the Brandon State School suggest that the two diseases were somehow related. It is an unusual coincidence to have two diseases strike the several persons in a definite sequence. Unfortunately, the evidence is too meager and inconclusive to establish any definite relationship. It is not unreasonable to postulate the existence of an acute inflammatory process in the duodenum or biliary passages which could produce edema and transient obstructive jaundice such as was observed in this series of cases.

SUMMARY

During the simultaneous occurrence of epidemics of bacillary dysentery (Flexner type) and infectious jaundice 32 patients showed symptoms of dysentery alone during the first phase of the epidemic, 26 showed symptoms of dysentery and jaundice and 62 patients presented jaundice alone.

Bacteriologic examinations of stool specimens for the Flexner organism gave positive results in 5 cases presenting symptoms of dysentery alone, 2 cases presenting symptoms of dysentery and jaundice and 5 cases presenting jaundice alone and revealed the presence of the organism in fourteen symptom-free carriers. The dysentery organisms were demonstrated in stool specimens intermittently for weeks or months after the end of the acute epidemics.

The epidemic of dysentery was probably introduced by a symptom-free carrier. The disease was spread through improperly disinfected clothing passing through a central laundry. The epidemics finally were controlled. Through repeated bacteriologic examinations and rigid isolation and disinfecting precautions, the institution seems to be free of the disease at the end of one year.

TABLE 3.—Results of Repeated Bacteriologic Examinations on Stool Specimens of Patients and Carriers During Combined Epidemics of Bacillary Dysentery and Infectious Jaundice, March to September 1940

Case	March 4	April 13	April 24	May 7	May 17	June 3	July 29	Sept. 23
3.....	+
6.....	..	+	+	+	+
9.....	+
28.....	+
29.....	..	+
40.....	+
41.....	+
46.....	+
81.....	+
85.....	+
86.....	..	+	+	+
89.....	..	+	..	+
Symptom-free carriers								
H. F.	+
N. E.	+
S. H.	+
B. J.	+
M. H.	+	+	+	+	..
K. M.	+
R. R.	+
D. L.	+
U. L.	+
L. D.	+	+	+
W. H.	+	+	+	+	+
A. G.	+
L. H.	+
F. W.	+	+	+	+	+	+	+	..

masks to avoid unconscious hand to mouth contamination. The utilization of all these methods finally checked the spread of the epidemics.

The sources of spread from the original dormitory involved were intensively investigated. The original spread occurred through inadequately disinfected soiled clothing which was handled in the central laundry by inmates of other buildings. A symptom-free carrier was also discovered among the girl inmates working in the

THE RENAL BLOOD FLOW IN HYPERTENSION

AS DETERMINED IN PATIENTS WITH VARIABLE,
WITH EARLY AND WITH LONG-STANDING
HYPERTENSION

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Experimental hypertension by the production of renal ischemia¹ suggests the possibility that the same abnormality underlies the mechanism of human hypertension. Smith and his associates² examined patients with essential hypertension by means of the diodrast clearance test³ and reported a reduction in the renal blood flow. However, Chesley and his associates,⁴ employing the same method of determining the renal blood flow, reported that the hypertension found in women suffering from toxemia of pregnancy was not associated with a reduction in renal blood flow, and they were not able

with variable or fluctuating hypertension as well as in those with long-standing hypertension. In this report, the results of such a study are given.

DESCRIPTION OF CLINICAL MATERIAL

The patients studied were divided into three groups corresponding to the duration of their hypertension. Group 1 consisted of 15 patients (9 men and 6 women) who were known to have had hypertension for more than ten years. Group 2 consisted of 6 patients (5 men and 1 woman) who were known to have had hypertension for less than six years. The duration of hypertension in group 2 was calculated as the time interval between the last recording of a normal blood pressure and the date of our observations. Group 3 consisted of 6 patients (5 men and 1 woman) who had been observed to have readings of blood pressure which were frequently elevated but whose blood pressures were known to have been within the range of normal at various times in the year preceding our determinations.

DESCRIPTION OF METHODS

A careful history was recorded, and a physical examination relevant to our problem was performed on each patient. Every effort was made to exclude those patients who may have had glomerular nephritis.

Routine intravenous pyelography (with diodrast),⁵ examination of the urine and determination of the specific gravity of a concentrated specimen of urine (twelve hours) were performed on almost every patient.

The effective renal blood flow and the rate of glomerular filtration were determined by means of diodrast and inulin clearances. These were done concomitantly, and the methods used were identical with those detailed in a previous report. The filtration fraction was obtained by calculating the value of the ratio: $\frac{\text{diodrast clearance—cc. per minute}}{\text{inulin clearance—cc. per minute}}$. Readings of blood pressure were obtained on each patient at the beginning, middle and end of the clearance tests, and the values recorded represent the average of the three readings. The patients rested in recumbency after a fasting period of twelve hours, and psychic factors were minimized as much as possible.

RESULTS

A. The Renal Blood Flow and Inulin Clearance in Long-Standing Hypertension (Group 1).—The effective renal blood flow as measured by the diodrast clearance test was found to average 684 cc. a minute in the 9 men studied and 728 cc. a minute in the 6 women. A comparison of these average values with those found in normal persons (tables 1 and 2) indicates that there was approximately a 47 per cent reduction in flow in the men and a 29 per cent reduction in the women in this hypertensive group. This apparent discrepancy in the reduction of renal blood flow between men and women with hypertension was probably not real but was due to the fact that the male group included 4 patients with malignant hypertension, and there was no one with this condition in the female group. If one omits the cases of malignant hypertension the average reduction in renal blood flow for the men was approximately 35 per cent. Table 2 indicates a wide range in the values for the flow, and it will be observed that 2 of the men and 1 of the women had values which were within the normal range although below the normal average.

5. The Winthrop Chemical Company, Inc., supplied us with quantities of diodrast.

TABLE 1.—Clearance Determinations in Normal Persons

Patient	Age	Blood Pressure at Test, Mm. of Hg	Specific Gravity of Concentrated Urine	Effective Renal Blood Flow, Cc. per Min.	Renal Inulin Clearance, Cc. per Min.	Filtration Fraction, Percentage
A. Men						
1. P. L.	22	130/80	1.020	1,285	110.0	15.0
2. J. N.	50	110/70	1.022	1,380	.....	.....
3. S. L.	50	120/70	1.022	1,390	.....	.....
4. A. E.	47	120/68	1.025	1,125	137.0	20.5
5. S. B.	25	120/75	1.025	1,640	128.0	12.9
6. G. S.	25	110/75	.....	910	122.5	22.7
			Average	1,288	124.4	17.8
B. Women						
7. E. H.	25	05/75	.....	990	153.0	22.0
8. L. D.	28	105/70	.....	855	117.0	20.1
9. M. C.	30	118/70	1.028	805	124.5	21.6
10. N. C.	40	125/78	1.024	1,045	116.5	16.4
11. E. M.	30	95/70	1.029	1,230	118.0	15.0
			Average	986	125.8	19.0

In the tables the effective renal blood flow = $\frac{\text{diodrast clearance}}{\text{plasma volume \%}}$, and the renal inulin clearances are adjusted to a surface area of 1.73 square meters.

to detect a diminution in renal blood flow in all cases of essential hypertension. Thus there are as yet a relative paucity of information and a lack of complete uniformity in the reports available concerning the relationship of renal blood flow to clinical hypertension. It appeared possible to elucidate this relationship further by means of a study which would include determinations of the renal blood flow in patients with early hypertension and

From the Harold Brunn Institute for Cardio-Vascular Research, Mount Zion Hospital.

Dr. William Picard, Patricia McLean, B.A., and E. MacNaughton, B.A., gave invaluable assistance in the execution of this problem.

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Unlike the determinations of the renal blood flow, the changes in the inulin clearances were not significant. Among the men, the average clearance was 104.3 cc. a minute, compared to the average normal clearance of 124.4 cc. a minute. Among the women, the average inulin clearance was 104.6 cc. a minute, compared to the average normal clearance of 125.8 cc. a minute.

Because of the small change in inulin clearance as compared to the diminution in diodrast clearance, the filtration fraction was found to be high in both sexes in group 1. Among the men, the average filtration fraction was 32.4 per cent (with a range of 16.5 to 49.4 per cent) and among the women 24.4 per cent (with a

in this group had a reduction in renal blood flow (table 3). Among the 5 men, the effective renal blood flow averaged 799 cc. a minute (with a range of 615 to 890 cc. a minute), and it is important to point out that, although the duration of the hypertension was much less in this group (one-half to six years) than in group 1, the average reduction in renal blood flow was as severe as in group 1 (if the cases of malignant hypertension are excluded). The renal flow of blood of the 1 woman was 680 cc. a minute, which was also below the normal value.

The average inulin clearance of the men was 124.9 cc. a minute (with a range of 110 to 141 cc. a minute),

TABLE 2.—*Clearance Determinations in Essential Hypertension (Long-Standing)*

	Patient	Age	Blood Pressure at Test, Mm. Hg	Specific Gravity of Concentrated Urine	Urinalysis				Intravenous Pyelogram	Effective Renal Blood Flow, Cc. per Min.	Renal Inulin Clearance, Cc. per Min.	Filtration Fraction, Percentage
					Red Blood Cells	White Blood Cells	Casts	Albumin				
A. Men	1. R. O.	34	150/95	1.024	0	0	0	0	Normal	915	140.0	25.5
	2. L. L.	41	200/120	1.022	0	2-3	0	0	Normal	694	113.5	29.7
	3. C. G.	41	200/125	1.022	0	0	0	0	Normal	587	132.5	40.3
	4. F. P.*	52	230/140	1.022	1-2	2-5	1	+	Normal	386	88.2	30.7
	5. W. H.	38	200/115	1.025	0	0	0	0	Normal	805	118.0	21.8
	6. R. J.*	34	200/135	1.023	1-2	3	0	+	Normal	435	127.0	49.4
	7. L. G.*	32	220/135	1.020	1-2	2	1	0	Normal	367	108.0	45.5
	8. P. H.*	45	250/120	1.015	10-15	20	2-3	++	Normal	782	....	....
	9. H. B.	60	100/95	1.024	0	0	0	0	Normal	1,185	111.5	16.5
Average										684	104.3	32.4
B. Women	10. R. B.	43	195/120	1.023	0	0	0	0	Normal	519	112.5	34.4
	11. R. P.	41	140/100	1.026	0	0	0	0	Normal	745	121.0	26.0
	12. L. N.	38	175/115	1.025	0	0	0	0	Normal	710	134.0	20.5
	13. L. G.	26	200/125	1.023	0	0	0	0	Normal	872	104.0	19.3
	14. L. W.	30	180/118	1.026	0	0	0	0	Normal	770	102.5	20.5
	15. A. C.	49	215/128	1.022	0	0	0	0	Only 1 kidney seen	750	77.5	19.0
	Normal									728	108.0	24.4

* Malignant hypertension.

TABLE 3.—*Clearance Determinations in Early Essential Hypertension*

	Patient	Age	Maximal Duration of Hypertension, Years	Blood Pressure at Test, Mm. Hg	Specific Gravity of Concentrated Urine	Urinalysis				Intravenous Pyelogram	Effective Renal Blood Flow, Cc. per Min.	Renal Inulin Clearance, Cc. per Min.	Filtration Fraction, Percentage
						Red Blood Cells	White Blood Cells	Casts	Albumin				
A. Men	1. A. M.	50	3	170/95	1.020	0	0	0	0	Normal	800	110	19.4
	2. A. H.	53	½	150/100	1.025	0	0	0	0	Normal	850	121	25.7
	3. A. H.	25	0	150/100	1.025	0	0	0	0	Normal	840	141	29.2
	4. R. M.	17	1	170/100	1.026	0	0	0	0	Normal	890	140	28.2
	5. T. S.	20	2	155/95	1.025	0	0	0	0	Normal	615	112.5	32.1
Average											799	124.9	26.9
B. Women	6. G. W.	41	5	200/120	1.018	0	0	0	0	Normal	680	123	30.2

range of 19.0 to 34.4 per cent). Examination of table 1 will indicate that these values represent an appreciable elevation over those of normal persons.

Intravenous pyelography revealed no abnormality except in 1 case (L. W., table 2) in which the left kidney was visualized and appeared to be enlarged and the right kidney could not be seen. Examination of the urine disclosed normal conditions in every case except in the 4 cases of malignant hypertension, in which, as can be seen in table 2, the urine showed in most cases the presence of erythrocytes, leukocytes, casts and albumin. In all cases except 1 the specific gravity of the concentrated specimen of urine was 1.020 or higher.

B. The Renal Blood Flow and Inulin Clearance in Early Hypertension (Group 2).—All persons studied

and of the woman it was 123 cc. a minute. These clearances were considered normal. As in group 1, and for the same reason, the filtration fraction was high in this group, 26.9 per cent (with a range of 19.4 to 32.1 per cent) for the men and 27.5 per cent for the 1 woman.

No abnormalities were observed in the intravenous pyelograms, and examinations of the urine gave uniformly negative results. The specific gravity of each specimen of urine was above 1.020, except for a reading of 1.018 for the specimen obtained from the woman of this group.

C. The Renal Blood Flow and Inulin Clearance in Variable Hypertension (Group 3).—There were 4 men and 1 woman in this group. Table 4 shows the range of readings of blood pressure obtained at various times

during the year preceding the performance of the clearance tests and shows also the average readings of blood pressure during the test itself. There exists a difference, perhaps significant, in the renal blood flow of the 2 patients (R. S. and P. W.) whose diastolic blood pressure during the test was below 80 mm. of mercury as compared with the others of the group, whose diastolic pressures were 85 mm. of mercury or higher during the test. For in the former 2, the flow of blood was within the normal range (990 and 1,055 cc. a minute respectively), while in the latter the flow was definitely decreased (615, 735 and 750 cc. a minute), and this decrease was comparable to that found in the other two groups.

The inulin clearance was essentially normal in every case. The filtration fractions in the 2 cases in which the diastolic pressure was below 80 mm. of mercury

group of 41 persons was classified according to the level of diastolic blood pressure. This group included 13 subjects with diastolic blood pressures of 80 mm. of mercury or lower, 16 whose diastolic pressures were between 80 and 100, 8 whose diastolic pressures were between 100 and 120 and 6 whose diastolic pressures ranged from 120 to 140.

Included in this group were 6 patients with coarctation of the aorta who were described in another report.⁶ When this classification was made (as shown in table 5 and the accompanying chart), it was found that there was a correlation between the effective renal blood flow and the diastolic pressure, for there was a progressive diminution in the renal blood flow with each interval increase in the level of diastolic pressure. The filtration fraction, however, was found progressively to increase as groups with higher diastolic pressure were con-

TABLE 4.—Clearance Determinations in Variable Hypertension

	Patient	Age	Range of Blood Pressure, Mm. Hg	Blood Pressure at Test, Mm. Hg	Specific Gravity of Concentrated Urine	Urinalysis				Intravenous Pyelogram	Effective Renal Blood Flow, Cc. per Min.	Renal Inulin Clearance, Cc. per Min.	Filtration Fraction, Percentage
						Red Blood Cells	White Blood Cells	Casts	Alb. min				
A. Men	1. R. S.	27	(164/ 90-120/75)	125/75	1.025	0	0	0	0	Normal	1,055	135.5	19.65
	2. P. W.	15	(160/110-110/70)	110/70	1.030	0	0	0	0	Normal	090	100.0	18.00
	3. H. R.	20	(150/100-135/85)	135/90	1.029	0	0	0	0	Normal	750	125.0	30.00
	4. M. M.	25	(160/100-125/80)	125/90	1.025	0	0	0	0	Normal	735	158.0	30.30
B. Women	5. L. S.	18	(170/110-135/80)	145/85	1.025	0	0	0	0	Normal	615	121.0	29.20

TABLE 5.—The Relation of Diodrast and Inulin Clearance to Diastolic Pressure (Normal and Elevated)

Diastolic Pressure, Mm. Hg	Effective Renal Blood Flow, Cc. per Minute						Inulin Clearance, Cc. per Minute				Filtration Fraction, Percentage					
	Number of Cases *	Range	Mean	Stand-ard Devia-tion of	Stand-ard Error of	Number of Cases	Range	Mean	Stand-ard Devia-tion of	Stand-ard Error of	Number of Cases	Range	Mean	Stand-ard Devia-tion of	Stand-ard Error of	
				Mean	Mean				Mean	Mean				Mean	Mean	Mean
60-80	13 (A)	(805-1,610)	1,130	±242	±67.3	11	(100 -153)	123.8	±14.35	±1.33	11	(15.0-22.7)	18.5	±3.28	±1.04	
80-100	16 (B)	(595-1,185)	793	±161	±40.3	16	(110 -158)	124.4	±18.45	±3.36	16	(16.5-32.7)	26.55	±4.48	±1.12	
100-120	8 (C)	(519- 805)	713	± 50.5	±20.2	7	(102.5-129.5)	119.0	± 9.92	±3.49	7	(20.5-34.4)	27.44	±4.92	±1.66	
120-140	6 (D)	(367- 872)	566	±240	±85	6	(77.5- 88.2)	106.2	±21.4	±8.75	6	(19.0-49.4)	34.03	±12.0	±5.28	

* There were 5 women included in group A, 4 in group B, 4 in group C and 2 in group D.

were within normal limits (18 per cent and 19.6 per cent) but were elevated in the remaining cases (29.2 per cent, 30.3 per cent and 30 per cent).

Intravenous pyelography (in 4 of the 5 cases) and examinations of the urine did not reveal any renal abnormality. Examination of the concentrated urinary specimen for specific gravity gave a value above 1.020 in every case.

D. The Relationship Between the Diastolic Pressure and the Renal Blood Flow, the Inulin Clearance and the Filtration Fraction.—In the preceding paragraphs, observations are given concerning the renal blood flow, the inulin clearance and the filtration fraction in long-standing, in early and in variable hypertension.

It was found that irrespective of the duration or stability of the hypertension there was a similarity in the average clearances of each group which indicated that there was no correlation between the duration of the hypertension and the clearance values. Accordingly, an attempt was made to determine whether a correlation existed between the height of the diastolic blood pressure and the clearance values. For this purpose, a

sidered. The increase was due to the relatively greater fall in the rate of blood flow as compared to the slighter fall in the inulin clearance. For instance, the average blood flow in persons whose diastolic pressure fell into the group of 60 to 80 mm. of mercury was 1,130 cc. a minute, and the inulin clearance was 123.8 cc. a minute, giving a filtration fraction of 18.5 per cent. By contrast, among those persons whose diastolic pressure averaged 120 to 140 mm. of mercury, the average renal blood flow was 566 cc. a minute, but the average inulin clearance was 106.2 cc. a minute, resulting in a filtration fraction of 34 per cent.

COMMENT

The importance of renal derangement in the pathogenesis of arterial hypertension has been well established both in the experimental animal and in certain well defined clinical conditions in which relief of the hypertension has followed the extirpation of a grossly diseased

6. Friedman, Meyer; Selzer, Arthur, and Rosenblum, Harold: The Renal Blood Flow in Coarctation of the Aorta, *J. Clin. Investigation*, 20: 107, 1941.

kidney.⁷ Nevertheless, before the Goldblatt principle of renal ischemia can be transferred to ordinary hypertension without gross renal disease, the presence of reduced renal blood flow in patients with essential hypertension must be demonstrated.

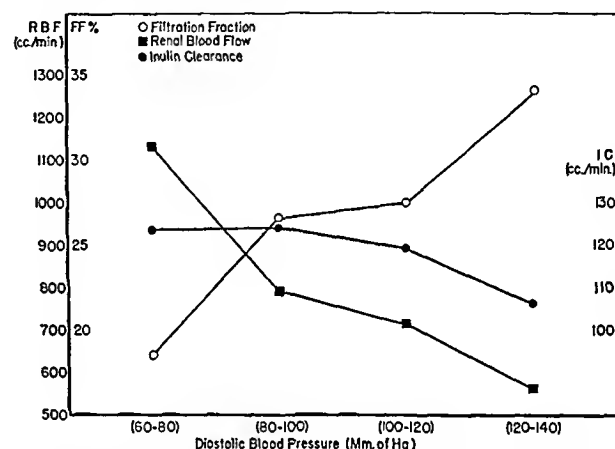
A reduction in the renal blood flow, as measured by the diodrast clearance, was found in 18 of the 21 patients with essential hypertension described in this communication. Also, among the 5 patients with variable hypertension a reduction in the renal flow was found in 3 of the patients whose diastolic pressures were elevated to 85 mm. of mercury or above at the time of the clearance tests. The remaining 2 patients, despite previous elevations of blood pressure, maintained normal pressures during the determinations and gave normal values for the renal blood flow. It may be added, moreover, that a reduction in renal blood flow previously had been demonstrated by us in 6 patients with coarctation of the aorta and hypertension.⁸ The finding of 3 hypertensive patients, however, who had renal blood flow values within the normal range indicates that renal ischemia is not necessarily present in essential hypertension. Chesley and his associates⁹ also found hypertensive persons who had a normal renal blood flow. Furthermore, it is important to emphasize that, if the 4 patients with malignant hypertension are excluded, the reduction in the renal blood flow of our hypertensive patients is not especially remarkable when compared to the average control value. Finally, it must be mentioned that Dock¹⁰ has found that kidneys obtained at autopsy from hypertensive patients who had no signs of uremia during life frequently show the same rate of flow when perfused with kerosene as do kidneys obtained from patients of the same age group without hypertension.

In view of these observations, it appears highly probable that renal ischemia, although present in the majority of the hypertensive patients herein examined, may well be a secondary or concomitant mechanism in the pathogenesis of essential hypertension. Thus the renal ischemia found in the hypertensive patient may be but a local manifestation of a generalized, systemic vasoconstriction, sharing in the latter, possibly aggravating it, but not primarily causing it.

In contrast to the observations on the blood flow, the inulin clearances were not materially altered in our cases of essential hypertension. This resulted in increased values for the filtration fraction. Smith¹⁰ has stressed the probable presence of increased tonus of the efferent glomerular arterioles as a striking abnormality in cases of essential hypertension. In the series reported here, there is evidence that the same mechanism is in operation. Such spasm, however, is not necessarily to be considered primary, because it may be, as has already been pointed out, part of the generalized vasoconstriction present in patients with hypertension, or finally it may be secondary to a primary disturbance in the glomerular circulation. The presence of efferent glomerular spasm in coarctation of the aorta,⁹ in which it is in all probability secondary to an interference in the blood supply afferent to the glomeruli, indicates the

possibility of efferent arteriolar adaptation to changes in the renal circulation. Furthermore, various pathologic studies¹¹ have shown that the kidneys of hypertensive patients usually show organic vascular obstruction not distal but proximal to the glomeruli. Thus there exists the strong possibility that the heightened tonus of the efferent glomerular arterioles observed in this study represented the reflex or chemically motivated ability of these vessels to maintain an effective glomerular filtration pressure despite extraglomerular or intraglomerular hemodynamic changes, whether these changes were of pulse pressure or of blood flow. Either this compensatory action of the efferent arterioles may intensify renal ischemia already present because of organic obstruction of the arterioles afferent to the glomerulus, or, more probably, because of primary changes in the glomerular pressure the increased tonus may itself initiate the renal ischemia.

The opportunity to study cases of known early hypertension permitted us to compare the renal blood flow and the rate of glomerular filtration in early and in long-standing hypertension. It became apparent that



Relation of the mean values of the renal blood flow, the inulin clearance and the filtration fraction to the diastolic pressure of the 43 patients studied (table 5).

no correlation existed between the duration of the hypertension and the degree of diminution in the flow of blood or glomerular efferent arteriolar spasm (as measured by the changes in the filtration fraction). On the other hand, a definite relationship was found to exist between the level of diastolic pressure, the rate of renal blood flow and the degree of glomerular efferent arteriolar tonus.

SUMMARY

1. The diodrast and inulin clearance tests were performed on a series of patients with hypertension of varying degree and duration.
2. In the great majority of cases of essential hypertension the effective renal blood flow was found to be moderately reduced, although glomerular filtration was not materially diminished.
3. There is a correlation between the level of the diastolic blood pressure, the rate of renal blood flow and the filtration fraction.

Post and Scott streets.

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AURICULAR FIBRILLATION IN CHILDHOOD AND ADOLESCENCE

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Auricular fibrillation is one of the most frequent and important of the cardiac arrhythmias. It may arise under a variety of conditions. In some instances auricular fibrillation may occur in persons who are apparently in good health and altogether free of symptoms or signs of heart disease. Among those who have heart disease, the incidence of auricular fibrillation varies widely, depending on the type of heart disease that is present. It is relatively rare in syphilitic heart disease, in bacterial endocarditis and in congenital cardiovascular anomalies. It is frequent in rheumatic heart disease, coronary disease, hypertension and thyrotoxicosis.

Auricular fibrillation is essentially a disorder of adult life. In a series of 575 patients with auricular fibrillation reported by McEachern and Baker,¹ only 0.5 per cent of the patients were under 10 and 4.2 per cent between 10 and 20 years of age.

Because of the infrequency of auricular fibrillation in childhood and adolescence, it has seemed worth while to analyze my small series of cases in an effort to determine under what circumstances this arrhythmia arises and to consider its influence on the patient's future. It is obvious that many of the factors that are operative in the etiology of auricular fibrillation in the adult, such as coronary disease, hypertension and thyrotoxicosis, are rare or nonexistent in childhood and adolescence. Rheumatic fever, the most frequent cause of auricular fibrillation in the adult, is the most prominent cause in early life also.

Among 864 patients with rheumatic heart disease seen at the Children's Memorial Hospital and at St. Luke's Hospital, I have encountered 21 instances of auricular fibrillation which have been verified by physical and electrocardiographic examination. Since the case histories bring out several significant facts, they are briefly summarized here. The cases are arranged in the order of age at the onset of fibrillation.

REPORT OF CASES

CASE 1.—B. K., a boy born May 11, 1932, had an indefinite history of joint pains at the age of 2 years. He was seen in the clinic at the age of 4 with established heart disease, and he entered the hospital on Dec. 13, 1939 with congestive heart failure. The apex of the heart was palpated in the sixth interspace in the anterior axillary line on the left side. There were systolic and presystolic murmurs at the apex. On three occasions the patient had brief episodes of auricular fibrillation (at 7 years). Digitalis was administered on each occasion. His course was downhill to death on May 9, 1940.

CASE 2.—E. K., a Negro boy born July 9, 1930, had a history of joint pains at the age of 5. He was admitted to the hospital April 28, 1938 because of fatigue and dyspnea. The heart was moderately enlarged, with systolic and mid-diastolic murmurs at the apex and the sedimentation rate of erythrocytes was increased. Auricular fibrillation was noted June 30 (at the age of 8). No digitalis was given. Regular rhythm returned five days later. There has been no recurrence of fibrillation, and the patient was discharged in good condition on Dec. 10, 1938.

This work was aided by the Bachmann Memorial Fund. From the cardiac services of the Children's Memorial Hospital and St. Luke's Hospital.

1. McEachern, D., and Baker, B. M., Jr.: Auricular Fibrillation: Its Etiology, Age Incidence and Production by Digitalis Therapy, *Am. J. M. Sc.* 183: 35 (Jan.) 1932.

CASE 3.—D. S., a girl born June 24, 1923, had rheumatic fever with cardiac involvement when she was 8. She was admitted to the hospital in April 1933 with congestive failure and rheumatic nodules on her elbows. The cardiac apex was in the fifth interspace, 1 inch (2.5 cm.) to the left of the nipple line and there were systolic and diastolic murmurs at the apex. Auricular fibrillation occurred on April 25 at the age of 9 years and 10 months. There had been no recent administration of digitalis. Fibrillation persisted until death, June 7, 1933.

CASE 4.—S. K., a boy born Aug. 10, 1922, had onset of heart trouble two years before admission to the hospital in June 1932. Congestive heart failure was present on admission. The cardiac apex was in the sixth interspace at the midaxillary line and there was a loud systolic murmur at the apex. Digitalis and mercurial diuretics were prescribed; administration of digitalis was stopped July 23. On September 8, auricular fibrillation occurred (at the age of 10). Pericarditis and nodules occurred during succeeding weeks. Fibrillation persisted until death on Jan. 24, 1933.

CASE 5.—D. O., a girl born May 11, 1921, was admitted to the hospital in August 1931 with a history of rheumatic fever three months before admission. Congestive failure was present. The cardiac apex was in the fifth interspace, 1 inch to the left of the nipple line. There was a systolic murmur at the apex. Auricular fibrillation was noted on Feb. 1, 1932 (at the age of 10). No digitalis had been taken recently. Fibrillation persisted until death on March 13, 1932.

CASE 6.—G. W., a girl born Sept. 16, 1925, had joint pains at the age of 6 years and again at the age of 8. She was admitted to the hospital Feb. 28, 1936. Edema of the legs and ascites were present on admission. The cardiac apex was in the seventh interspace in the midaxillary line, with a loud systolic murmur. Examination on admission revealed the presence of auricular fibrillation, which persisted during a hospital stay of twenty-six days at the age of 10. The patient had been taking digitalis for some time before admission to the hospital. She was taken home against medical advice. Her condition was critical.

CASE 7.—N. L., a girl born Feb. 12, 1922, had a history of rheumatic fever with congestive heart failure at the age of 5. She was admitted to the hospital June 27, 1932 with shortness of breath and swelling of the legs and abdomen. The cardiac apex was in the sixth interspace at the anterior axillary line. Systolic and diastolic murmurs were noted at the apex. On June 27 1½ grains (0.1 Gm.) of digitalis was administered, and a like amount on June 28. On the following day auricular fibrillation was discovered (at the age of 10). Fibrillation persisted until September 15, followed by two weeks of normal rhythm. Fibrillation then recurred and was present until discharge on Dec. 3, 1932. The patient's condition was fair at the time of discharge. She died at home three months later.

CASE 8.—I. D., a girl born Sept. 8, 1920, had her first rheumatic episode at the age of 5 years. There were several admissions to the hospital because of active rheumatic fever and varying degrees of heart failure. The last was in October 1929. The heart was enormous, with systolic and diastolic murmurs at the apex. Congestive failure was present, and fibrillation detected in September 1931, at the age of 11, persisted until February 1932, when normal rhythm returned for a few days. Auricular fibrillation recurred and persisted until discharge from the hospital in May. The patient was in poor condition on leaving the hospital and died at home about a year later.

CASE 9.—F. K., a girl born April 2, 1926, had rheumatic fever at the age of 9 years. She was admitted to the hospital May 27, 1937, because of pains in the joints and dyspnea. The apex of the heart was in the fifth interspace, ½ inch (1.3 cm.) to the left of the nipple line. There were systolic and mid-diastolic murmurs at the apex and an aortic diastolic murmur at the base of the heart. There was an active infection, with rheumatic nodules and a pericardial friction rub. Auricular fibrillation occurred on September 3 while digitalis was being administered (at the age of 11 years). Digitalis was discontinued. Normal rhythm returned six days after the onset of fibrillation and was maintained until death on July 24, 1938.

CASE 10.—E. R., a girl born Jan. 1, 1927, suffered cardiac damage discovered at the age of 7 years. She was admitted to the hospital July 30, 1938 with shortness of breath and swelling of the legs. The cardiac apex was palpated in the sixth interspace in the anterior axillary line. Systolic and diastolic murmurs were present at the apex. Auricular fibrillation occurred on August 27 (at the age of 11 years). The patient had received digitalis for five days before the onset of fibrillation. The condition persisted until death on September 7.

CASE 11.—J. W., a girl born May 13, 1929, was in the hospital with chorea from June to August 1937. She was readmitted in August 1938 with active rheumatic fever. Rheumatic nodules were present. She was discharged in good condition. On a third admission Aug. 7, 1940 extreme dyspnea and swelling of the legs and abdomen were present. Incisions made in the feet gave some relief of edema. On September 7 auricular fibrillation was noted (at the age of 11). The patient had been receiving digitalis for several days before the onset of fibrillation. The heart was noticeably enlarged, with systolic and diastolic murmurs at the apex. Digitalis was withdrawn on the appearance of fibrillation. There was a return to normal rhythm three days later. The patient at present is in the hospital in a critical condition.

CASE 12.—E. A., a girl born Feb. 12, 1923, had rheumatic fever in May 1930 and was admitted to the hospital with congestive heart failure in 1932, 1933 and finally on June 4, 1935. On her final admission, the heart was noticeably enlarged, with the apex in the sixth interspace at the anterior axillary line. There were systolic and diastolic murmurs at the apex and a diastolic murmur at the base of the heart. Auricular fibrillation was present at the age of 12. The patient was discharged Feb. 12, 1936 because she was overage but she was followed in the outpatient department to Nov. 20, 1936. Fibrillation was present at all visits. Death occurred July 12, 1937.

CASE 13.—H. O., a girl born Jan. 23, 1920, had a "touch of heart trouble" at the age of 9. She was admitted to the hospital May 14, 1932 with dyspnea, cough and swelling of the legs. The cardiac apex was palpated in the sixth interspace 1 inch to the left of the nipple line. There was a loud systolic murmur at the apex. Auricular fibrillation was present July 21, at the age of 12. Digitalis had been taken for two weeks before the onset of fibrillation. The patient's course was steadily downhill with persisting fibrillation to death on Oct. 20, 1932.

CASE 14.—E. O., a boy born Oct. 27, 1924, had joint pains and rheumatic heart disease at the age of 8 years. There had been four admissions to the hospital for rheumatic fever, with the final one on Feb. 17, 1937. Joint pains had occurred two weeks previously. Congestive heart failure was present. The apex of the heart was in the fifth interspace $\frac{3}{4}$ inch (2 cm.) to the left of the nipple line. There were systolic and diastolic murmurs at the apex. Auricular fibrillation was present on admission (at the age of 12). There was no history of recent administration of digitalis. Regular sinus rhythm was reestablished on August 30. Cardiac action remained regular until death on October 18.

CASE 15.—H. H., a girl born May 22, 1922, had rheumatic fever in April 1933. She was seen in the outpatient clinic Jan. 10, 1936. Congestive failure was present. The apex of the heart was in the sixth interspace in the anterior axillary line. There were systolic and presystolic murmurs at the apex. Fibrillation was present (at the age of 13). The patient did not return to the clinic. Her mother reported one year later that the patient was still in bed and that her legs and abdomen were swollen.

CASE 16.—A. S., a girl born March 31, 1922, had rheumatic fever at the age of 7 years and congestive heart failure at the age of 8. She was admitted to the hospital July 17, 1936 with congestive heart failure. The apex of the heart was in the seventh interspace at the anterior axillary line. There were systolic and diastolic murmurs at the apex. Auricular fibrillation was present on admission (at the age of 14). The patient was discharged from the hospital improved and was followed in the outpatient clinic until March 1938, fibrillation being present at all visits. Death occurred July 10.

CASE 17.—N. D., a girl born May 3, 1921, suffered joint pains in July 1929. She was first seen in the outpatient clinic June 29, 1934 and returned at regular intervals. She had a cold and bronchitis in January 1937. When she returned to the clinic February 26 auricular fibrillation was present. No digitalis was given. There was a moderate degree of congestive failure and the heart was moderately enlarged, with systolic and diastolic murmurs at the apex and a diastolic murmur at the base. The patient has remained fairly comfortable on varying doses of digitalis and restricted activity. She was last seen in the clinic June 14, 1940. Fibrillation has persisted for three years.

CASE 18.—F. T., a girl born Sept. 26, 1920, had her first attack of rheumatic fever at the age of 2, and a recurrent infection the following year, with rheumatic nodules. Her course was uneventful until Sept. 3, 1937, at which time she came to the clinic complaining of shortness of breath and epigastric pain. Fibrillation was present at the age of 17. No digitalis had been given her. The heart was moderately enlarged with systolic and diastolic murmurs at the apex. Fibrillation has continued up to her last visit to the clinic on Oct. 4, 1940. The patient remains fairly comfortable with rest and digitalis. Fibrillation has been present for three years.

CASE 19.—D. Z., a boy born July 21, 1921, had rheumatic fever at the age of 4 years and congestive failure at 7. He did well for several years, being followed in the outpatient clinic. On Jan. 14, 1938, auricular fibrillation was present. No digitalis had been administered. The heart was moderately enlarged. There were systolic and presystolic murmurs at the apex and a diastolic murmur at the base. One week later the cardiac mechanism was found normal. Fibrillation recurred July 29, 1938 (at the age of 17). No digitalis had been given. Fibrillation persisted until his last visit, May 3, 1940. The boy suffered a hemiplegic accident in March 1940 and died suddenly at home September 5. The known duration of fibrillation was about two years.

CASE 20.—J. Z., a boy born Aug. 27, 1921, had his first rheumatic episode at an uncertain date. He was known to have established heart disease at the age of 13. He suffered recurrent rheumatic fever the following year. He was seen in the clinic Dec. 9, 1938. Auricular fibrillation was present (at 17) and there was slight congestive failure. The cardiac apex was in the sixth interspace 1 inch to the left of the nipple line. There were systolic and diastolic murmurs at the apex. The boy was hospitalized in November 1939 because of heart failure. Fibrillation has persisted. His last visit to the clinic was on May 24, 1940. Fibrillation has been present for eighteen months, but the patient was comfortable when last seen.

CASE 21.—L. C., a boy born in 1919, had his first attack of rheumatic fever at the age of 8 years. He was seen in the clinic at the age of 12 with established heart disease and returned March 19, 1936 with a history of a cold during the preceding week. Auricular fibrillation was present at the age of 17. The apex of the heart was in the fifth interspace at the nipple line; there were systolic and diastolic murmurs at the apex. Fibrillation persisted until his last visit on June 3, 1938. The patient had been comfortable and was working as a filing clerk. He died suddenly while at work in June 1938. Fibrillation had been present two years.

COMMENT

An analysis of the foregoing case histories leaves no doubt of the serious nature of auricular fibrillation occurring in childhood and adolescence. Physical examination revealed the presence of murmurs indicative of mitral damage in all cases. Cardiac enlargement was present in every instance, and in the majority of cases it was considerable. Congestive heart failure was present in 18 of the 21 cases. In 13 instances there was definite evidence of congestive failure before the onset of fibrillation. In the other 5 instances both congestive

failure and fibrillation were present when the examination was made, and the sequence of events could not be determined.

The role of active rheumatic infection in the etiology of auricular fibrillation is undetermined. Some have found evidence that even in the adult fibrillation is more likely to occur in patients with active rheumatic infection than in those free from symptoms or signs of rheumatic activity. De la Chapelle, Graef and Rottino² studied the hearts of 119 patients who had rheumatic heart disease. They found that all the patients with auricular fibrillation dying under the age of 40 showed active rheumatic carditis, whereas in 17 per cent of the sinus rhythm group the rheumatic carditis was inactive. Certainly in the group of children and adolescents just presented active infection was present in practically every instance. It is well known that congestive heart failure rarely occurs in the rheumatic fever of young people in the absence of active infection. In the aforementioned group of 21 patients, 18 had congestive heart failure. In the majority of instances fever, rheumatic nodules or a pericardial friction rub gave added proof of rheumatic activity.

It is well known that full doses of digitalis may be a cause of auricular fibrillation. On this account I have noted whenever information was available whether digitalis was being administered before the onset of the arrhythmia and whether its subsequent withdrawal resulted in a return to normal rhythm. In cases 1, 9 and 11 digitalis appeared to be responsible for the occurrence of auricular fibrillation. In these instances heavy doses of digitalis had been given, the withdrawal of digitalis resulted in a return to normal rhythm within a short time and fibrillation did not occur.

The occurrence of auricular fibrillation in childhood is a signal of impending disaster. In adolescence the outlook is less grave, although even in this period survival is usually limited to a few years. Wilson³ stated that among 18 subjects under 16 at the time of onset of auricular fibrillation 12 died, the majority within a year of onset. Six were living one to nine years after the onset. Cookson⁴ reported on 23 patients with auricular fibrillation followed to death in whom fibrillation began between the ages of 12 and 17. The average duration of fibrillation was ten months. Schwartz and Weiss⁵ reported on 10 patients with auricular fibrillation in childhood. Four children died within one week after the onset of fibrillation and 3 within a year; 1 lived about two years, 1 four years and 1 was still living at the time of the report.

Of the 21 patients described in the present paper, 14 are known to have died. Two were in a critical condition when last seen and a third, now in the hospital, has advanced heart failure with little prospect of improvement. The 8 year old Negro boy (case 2) left the hospital in good condition and had less cardiac damage than any other in the series. I have not been able to trace his subsequent course. Three patients, all older adolescents, are reasonably comfortable, though their activities are greatly restricted. In the group from 9 to 12 years of age, the average length of life after the

onset of fibrillation was eight months, whereas in the teen age children who have died it was twenty-nine months. The 3 adolescents in whom auricular fibrillation began at age 17 are still alive, the average duration of fibrillation being thirty months.

SUMMARY

1. Among 864 children with rheumatic heart disease, auricular fibrillation was found in 21.
2. Serious cardiac damage was present in every patient.
3. Congestive heart failure was present in 18 patients.
4. The onset of auricular fibrillation in childhood is a grave prognostic sign, death usually occurring within a few months or years.

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Clinical Notes, Suggestions and New Instruments

SPINAL ANESTHESIA AND INJURY TO THE NERVOUS MECHANISM OF MICTURITION

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Lesions of the cauda equina and conus medullaris of the spinal cord after spinal anesthesia are rather uncommon. As the nerve injury to the spinal cord is usually not extensive, the condition may not be obvious and is frequently overlooked. This damage may be responsible, however, for postanesthetic retention of the urine. If the disorder persists, transurethral resection of a portion of the internal sphincter of the bladder may overcome this unfortunate complication.

In a rather complete review of the literature, Light and his associates¹ reported several cases of disturbances of the bladder and rectal sphincter after spinal anesthesia. Critchley² listed this complication as third in frequency after postanesthetic headache and abducens palsy (paralysis of the sixth cranial nerve). He reported 8 cases of the development of retention of urine, all in persons in their sixth and seventh decades with the exception of a woman aged 40. Peirson³ discussed a neuropathic condition of the bladder seen in the presence of a minimal lesion of the spinal cord. In this instance the nerve function of the bladder seemed intact but the sphincters were spastic instead of relaxed. In addition, the sphincters could not be relaxed voluntarily. The final picture was one of complete retention. In 3 of the 6 cases reported by Peirson, transurethral resection of the internal sphincter of the bladder accomplished successful outcomes. The neurologic diagnosis was poliomyelitis in 1 case and tabes dorsalis in 2. Peirson and Twomey⁴ reported a case of retention of urine and constipation following spinal anesthesia for an appendectomy. The patient, aged 60, had had retention of urine for two and a half months. Presacral neurectomy entirely relieved this difficulty.

In view of the paucity of reports on the significance of injury to the lumbosacral portion of the spinal cord following spinal anesthesia and the means of successful attack on this complication, I submit the following report of a case:

REPORT OF CASE

M. C. C., a man aged 26, seen for the first time on Feb. 29, 1940, complained of inability to urinate voluntarily and reported severe constipation since an appendectomy under spinal anesthesia performed on Nov. 22, 1939. Before the operation his urinary and bowel functions had always been entirely normal.

2. De la Chapelle, C. E.; Graef, I., and Rottino, A.: Studies in Rheumatic Heart Disease: An Analysis of One Hundred and Nineteen Hearts with Special Reference to the Relationship of Auricular Fibrillation to Mitral Valvular Deformity and Certain Rheumatic Tissue Changes, *Am. Heart J.* **10**: 62 (Oct.) 1934.

3. Wilson, M. G.: Rheumatic Fever, New York, Commonwealth Fund, Division of Publications, 1940.

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5. Schwartz, S. P., and Weiss, M. M.: Auricular Fibrillation in Children: Its Relation to Rheumatic Heart Disease, *Am. J. Dis. Child.* **36**: 22 (July) 1928.

1. Light, Geraldine; Sweet, W. H.; Livingstone, Huberta, and Engel, Rose: Neurologic Changes Following Spinal Anesthesia, *Surgery* **7**: 138 (Jan.) 1940.

2. Critchley, Macdonald: Discussion on the Neurological Sequelae of Spinal Anesthesia, *Proc. Roy Soc. Med.* **30**: 1007 (June) 1937.

3. Peirson, E. L., Jr.: Transurethral Resection of the Internal Sphincter in a Certain Type of Cord Bladder, *New England J. Med.* **213**: 50 (July 11) 1935.

4. Peirson, E. L., and Twomey, C. F.: Neurogenic Dysfunction of the Bladder Due to Spinal Anesthesia, *New England J. Med.* **223**: 171 (Aug. 1) 1940.

Immediately after the operation and for the next week he had to be catheterized at intervals. Subsequently he was treated with an indwelling urethral catheter for forty-eight hours, irrigations of the bladder, sounds and various drugs. Since his discharge from the hospital he had been catheterizing himself three or four times a day. This was performed whenever he experienced a sense of fullness in the bladder. There had been no incontinence and no dribbling of urine. On two occasions, with extreme straining, he had been able to express small jets of urine, totaling about 5 cc. in each instance. The past history was insignificant except that he had suffered an attack of abdominal pain in his right side three years before. Appendicitis was suspected, but the condition was diagnosed as a calculus in the right ureter. He did not recall having passed a urinary stone. He had always enjoyed splendid health aside from the aforementioned interludes.

The patient was a college graduate; he was cooperative, mentally calm and intelligent. His attitude was generally normal and entirely devoid of any psychotic tendencies. A complete survey revealed no abnormality except a McBurney operative scar on the right side. Urologic examination disclosed a mild, watery, milky exudate present in the canal of the urethra, observed only when the lips of the meatus were spread apart. Rectal digital palpation revealed that the tone of the sphincter of the anus was fair, and there was ability to contract this muscle voluntarily. The prostate was of normal size, shape and consistency.

A neurologic survey⁵ disclosed some diminution in sensation in the perianal region. This area corresponded to the peripheral distribution of the roots of the fourth and fifth sacral nerves. The knee jerks were equivocal on the two sides. The ankle jerks were equal and moderately active. The plantar reflex was normal. There was absence of the anal reflex. That is, scratching of the skin in the perianal region failed to produce any response.

Laboratory studies of the catheterized urine indicated an infection with *Bacillus coli*. The Wassermann reactions of the blood and spinal fluid were negative. An examination with the cystoscope gave the following information: No undue pressure of the ocular end was required to pass the beak through the posterior urethra. A definite "give" sensation was experienced when the instrument was passed into the bladder. The mucous membrane of the entire bladder possessed a pale yellow appearance, with normal vascular markings and a lacy

trabeculation over the base and lateral walls. The fundus, however, showed an increase in the size of the muscle bundles. The trigon was not hypertrophic and the interureteric ridge not prominent. There was no intrusion of the prostate. The view from the level of the verumontanum showed the border of the internal sphincter moderately elevated and the floor of the bladder obliterated. This simulated the appearance of a median bar of mild character. There was an increase in height of the posterior urethra but no dilatation.

There was no degree of movement of the internal sphincter seen when a voluntary attempt was made to void. The external sphincter, however, exhibited an active opening.

A cystometrogram was made (fig. 1). This showed some loss of tone in the muscle of the bladder. With a soft rubber

catheter in the bladder voluntary attempts at straining did not cause the urine to be ejected with much force. Sensations in the bladder of heat, cold and pain (produced by pinching the mucous membrane with biopsy forceps during cystoscopy) were intact. A cystogram was made by filling the bladder with a 4 per cent solution of sodium iodide. The patient was asked to strain and make every effort to void during the exposure of the film. Several such films were made, and each showed the

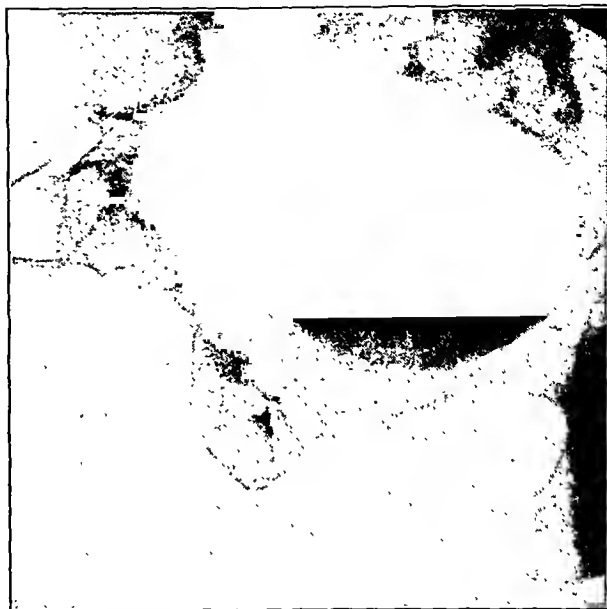


Fig. 2.—Cystogram showing sharp line of demarcation at neck of bladder. None of the contrast medium escaped through the internal sphincter into the posterior urethra.

same picture (fig. 2). There was a sharp line of demarcation at the level of the internal sphincter at the neck of the bladder. None of the contrast medium had escaped through the internal sphincter into the posterior urethra.

The history of the onset of retention of urine and constipation following spinal anesthesia and lasting three months suggested a lesion of the spinal cord. This was not relieved by the usual methods. The neurologic observations—loss of tone in the muscle of the bladder as deduced from the cystometrogram and the inability to relax the internal sphincter seen on cystoscopy and confirmed with the cystogram—served as additional evidence. The median bar effect, as observed on cystoscopy, also pointed to a spastic state of the internal sphincter. The information just mentioned indicated an injury to the sacral portion of the spinal cord (second to fourth sacral nerves), whence the parasympathetic nerves take origin. The removal of the influence of the parasympathetic nerves permitted the sympathetic nervous component uninhibited activity. This resulted in spastic contracture of the internal sphincter and loss in tone and expelling force of the detrusor muscle.

It was felt that the patient might be aided by three possible measures, namely (a) drug therapy, (b) direct attack on the internal sphincter or (c) presacral neurectomy. Stimulation with drugs might produce sufficient motor activity of the parasympathetic nervous system to relax the internal sphincter of the bladder and permit voiding. Similarly, inhibition with drugs of the overpowering action of the sympathetic nerves might result in relieving the retention of urine. Accordingly, the patient was given subcutaneously 0.5 mg. of ergotamine tartrate. This caused numerous side effects but did not produce voiding. Twenty-five mg. of acetyl-beta-methylcholine chloride, a parasympathetic stimulant, hypodermically, caused desire to void, but the patient was unable to initiate urination. These drugs were not used in combination because of the profound side effects observed when each drug was given separately.

On March 11 under anesthesia with pentothal sodium, resection of the internal sphincter was performed with the McCarthy instrument. Six bites of tissue were taken from the posterior and posterolateral aspects. Within forty-eight hours the

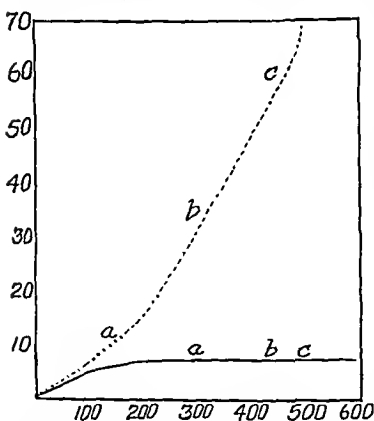


Fig. 1.—Cystometrogram in which the dotted line indicates the normal bladder, the solid line the bladder of the patient described prior to operation: (a) first desire to void, (b) sense of fullness and (c) pain of overdistention. The abscissa denotes cubic centimeters of fluid entering cavity of bladder; the ordinate, pressure within bladder cavity expressed in millimeters of mercury.

5. The neurologic studies were made by Dr. Exum Walker of Atlanta, Ga.

indwelling catheter was removed. Four hours later the patient spontaneously voided 8 ounces (236 cc.) of urine. During the following two weeks he continued to void, dispensing entirely with the necessity of catheterization. He averaged $8\frac{1}{2}$ ounces (250 cc.) at each urination at intervals of three to four hours. There was no incontinence or dribbling, although there was a slight difficulty in starting the stream and considerable straining of the muscles of the abdomen was required. Once the stream was started it was continuous but remained so only while the patient strained. If the influence of the muscles of the abdomen was removed, the stream would cease. The patient voided better in the sitting position. During the first week after the operation on two occasions there was a residual amount of urine in the bladder of 120 and 200 cc. respectively. This became zero by the eleventh postoperative day. Concomitantly with the reduction of the residual urine the urinary stream became larger and more forceful and the muscular straining diminished notably. The urine was alkaline and contained numerous white blood cells. On the sixteenth postoperative day cystoscopy was performed. The site of operation was fairly well healed. There was a diminution in the height of the posterior urethra. The median bar effect no longer existed, and from the level of the verumontanum the floor of the bladder was readily seen. A cystometric study on the twenty-second postoperative day showed a diminution of the hypotonic state of the muscles of the bladder. The patient was further treated with urethral sounds and irrigations of the bladder. Five weeks after the operation the urine was free of infection. Little straining was required to initiate urination. The stream was continuous, forceful and full. There was no nocturia, and the average interval between voidings by day was four hours.

For three months the patient had been forced to give up his position as an engineer and had felt himself virtually a social outcast. Five weeks after operation he returned to work and again took up his customary social activities. Aside from the slight degree of straining required to initiate the urinary stream he has recovered completely and has remained entirely well.

COMMENT

The management of neurogenic conditions of the bladder is one of the most trying problems that the urologist has to face. Unless therapy is instituted, patients with these disorders die either from sepsis, renal decompensation from back pressure or both. A careful diagnostic study should be made in every case. The successful outcome in the case reported resulted from the fact that a clearcut diagnosis was achieved. It was discovered that the chemical injury from the drug used in the spinal anesthesia was restricted to a portion of the parasympathetic fibers in the sacral portion of the spinal cord (the second to the fourth sacral nerves). In addition, the injury of the affected nerves was minimal. Only the smaller fibers were influenced, the larger ones being sufficiently resistant to the noxious chemical injected. Furthermore, the duration of the lesion when treatment was instituted had been only three months. Peirson emphasized the time factor. He pointed out that in long-standing cases chronic overdilatation of the bladder damages the intrinsic musculature of the detrusor permanently, so that the chances of a successful recovery are poor. In attacks of short duration relief of the obstructing forces permits the muscle of the bladder to regain tone.

As a rule, neurogenic lesions of the bladder are complex. Most often there is involvement of the autonomic as well as the somatic nervous system in variable combinations. In cases of neurogenic lesion a word of warning should be issued in considering transurethral resection of the internal sphincter of the bladder as a method of treatment. Before this form of therapy is instituted the diagnosis should be made as accurately as the conditions permit. Transurethral resection of the internal sphincter of the bladder in cases of neurogenic dysfunction is recommended in cases in which (1) the nervous lesion seems restricted to the parasympathetic nervous system (second to fourth sacral nerves), (2) the sensation of the mucous membrane of the bladder is intact, (3) the internal sphincter seems spastic, (4) there is some residual tone in the muscle of the bladder and (5) the condition has not persisted sufficiently long to cause permanent damage and loss of tone of the detrusor muscle.

911 William-Oliver Building.

TEST FOR INCOMPETENT COMMUNICATING BRANCHES IN THE SURGICAL TREATMENT OF VARICOSE VEINS

GERALD H. PRATT, M.D., NEW YORK

Before one decides which type of treatment the patient who has varicose veins is to undergo, certain tests must be performed. These are:

1. Test for the adequacy of the arterial circulation: The history of arterial competence, freedom from rubor on dependence or pallor on elevation, the palpation of the dorsalis pedis and posterior tibial arteries and the oscillometric readings.

2. Tests for the adequate functioning of the deep venous circulation (modified Perthes test): The leg is elevated and the veins are emptied. A tourniquet is applied to the upper thigh to constrict the saphenous vein return flow. The patient then walks around the room for five minutes. Absence of pain in the calf or definite swelling of the foot and ankle indicates patent deep veins.

3. Test for competence of the saphenous femoral valve (modified Trendelenburg test): The leg is elevated and the veins are emptied. The tourniquet is applied to control the saphenous vein near the fossa ovalis. The patient then stands

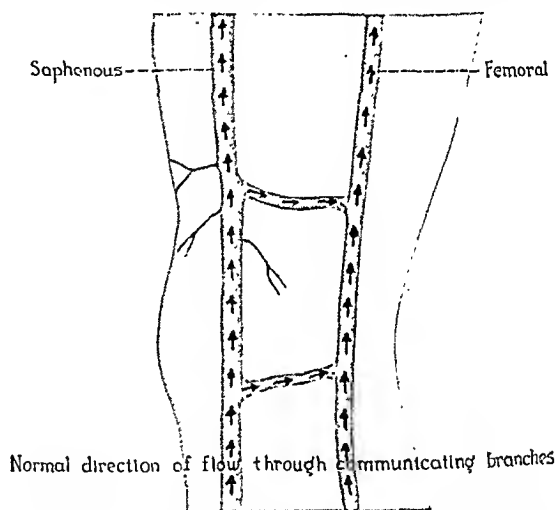


Fig. 1.—Normal direction of blood flow from the saphenous veins to the femoral vein through adequately valved communicating branches.

up and the tourniquet is removed at once. A sudden filling of the varices from above down indicates a reflux through the saphenous femoral valve and a valve incompetence.

4. Test for the incompetent communicating branch veins: This has been a source of error and an adequate, simple test is here presented.

A slightly higher incidence of recurrence of varicose veins in the first hundred patients compared with the subsequent 200 treated by the ligation and retrograde sclerosis technic previously described¹ was largely due to incorrect resection of incompetent communicating branch veins. Success in the operative treatment of varicose veins depends on:

1. The resection of the saphenous vein exactly at its junction with the femoral.

2. The resection of all the branches entering the saphenous femoral bulb and the upper part of the saphenous vein.

3. Adequate sclerosis of the entire superficial saphenous vein system.²

4. The resection of the communicating branches which have incompetent valves.

From the Surgical Vascular Clinic, New York Post-Graduate Hospital and Medical School, Columbia University.

1. Pratt, G. H.: Surgical Treatment of Varicose Veins and Ulcers by Segmental Sclerosis, *Am. J. Surg.* 44: 31-38 (April) 1939.
2. Pratt, G. H.: Segmental Sclerosis of the Saphenous Vein for Varicose Veins, Ulcers and Diminished Arterial Supply, *J. A. M. A.* 113: 925-927 (Sept. 2) 1939.

Figure 1 illustrates the normal direction of venous blood flow from the saphenous vein through communicating branch veins into the femoral vein. When the valves become incompetent because of injury or overdistention of the vein, the flow is reversed and femoral vein blood runs into the saphenous tree as shown in figure 2. Distention and swelling occur at this point. Failure to interrupt this backflow thus permits

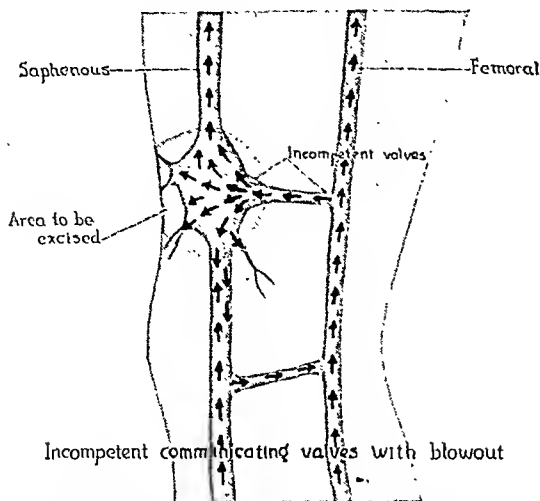


Fig. 2.—Reverse flow of femoral blood into the saphenous tree due to failure of communicating branch valves. This produces a blowout, which must be surgically corrected to prevent recurrences.

recanalization of the saphenous vein and recurrence of varicosities.

The identification of these incompetent communicating branches was difficult. The Trendelenburg double positive test was an indication of such incompetence but would not show at which point the incompetent branch presented. Other tests, such as the Mahorner-Ochsner multiple tourniquet test, were



Fig. 3.—Test for incompetent communicating branches. Leg has been elevated, veins have been emptied and tourniquet has been applied to constrict the saphenous vein. As bandage is unrolled, a bulge indicates the incompetence. When many incompetences exist, a second bandage is rolled on as the first is rolled off, and thus each new blowout is shown without a reflux from the previous blowout.

difficult to perform and to interpret and were so time consuming that they were not useful in the clinic. Further work has demonstrated the value of a test which is being used routinely with entire satisfaction; it embodies such a simple technic that it can be performed and accurately read within two minutes.

With the patient lying down, the leg to be tested is elevated and with light massage the veins are emptied. A tourniquet is

placed sufficiently high in the thigh to close off the saphenous vein. An Ace bandage is then applied from the toes to the tourniquet. The patient then stands up and the Ace bandage is slowly unwound from above down. With the tourniquet above preventing reflux of femoral blood through the saphenous valve and with the Ace bandage below compressing the remainder of the saphenous vein, a bulge or blowout indicates an incompetent communicating branch vein (fig. 3). Such an area is marked with an indelible pencil and is a point where a secondary ligation will be required. In a limb in which there are many such blowouts a second Ace bandage is applied from above down. As the first Ace bandage is slowly removed, a blowout appearing between the two Ace bandages is thus a new one and must also be marked and resected. While in most instances there are only one or two such blowouts, occasionally one finds four or five. Failure to remove such other blowouts results in recurrences. From a practical standpoint, while doing this test, one has also tested the patency of the deep femoral veins, because if there were a thrombosis in the deep veins the tourniquet applied would prevent a return flow through the saphenous tree and there would be no venous return from the limb with a resultant severe pain and swelling in the calf.

This test has been used some one thousand times and in over three hundred resections it has successfully proved its value in the interpretation of where to place secondary ligations.

400 Madison Avenue.

A CASE OF SUBACUTE BACTERIAL ENDOCARDITIS WITH APPARENT CURE

J. S. DRUCKMAN, M.D., LOS ANGELES

This case is reported to demonstrate the occasional value of sulfonamide derivatives in subacute bacterial endocarditis. Moreover, in this instance the superiority of the sulfonamide derivatives as compared to other agents in this disease is brought into relief by failure attending antecedent therapy.

History.—Miss P. F. was first seen by me privately on Oct. 13, 1939. Her chief complaint was that of a swollen, tender area on the left foot of six days' duration. There was also a history of a rise in temperature to 102 F. in the afternoon, which had originated seven weeks previously in August 1939. Preceding this low grade temperature, gastrointestinal symptoms had developed in June 1939. These were dyspepsia, belching, constipation and anorexia. A loss of 17 pounds (7.7 Kg.) began at this time. The patient also mentioned recent anorexia and night sweats. Her past history was that of a chronic cardiac patient. She suffered from growing pains at the age of 5 years. Rheumatic fever with carditis and arthritis confined the patient to a convalescent home for four years between the ages of 14 and 18 years. In September 1937 she was again hospitalized with another attack of cardiac pain. On her arrival in California from her home in New York City one and one-half years before I saw her she was relatively asymptomatic. She was examined for the gastrointestinal symptoms that developed in June 1939 at the Los Angeles General Hospital outpatient department. She was discharged after a few days of observation.

Physical Examination.—The patient, who had the appearance of being chronically ill, was apparently an Italo-American. She had a pallid olive complexion. Her appearance was younger than her stated age of 31 years. She weighed 95 pounds (43.1 Kg.), her average weight having been 114 pounds (51.7 Kg.) in the last five years. Her temperature was 101 F. and her heart rate was 98 beats a minute. The blood pressure gave readings of 108 mm. of mercury systolic and 72 mm. diastolic. The eyes showed no exophthalmos or lid lag. The conjunctivas were free of petechiae; the pupils were regular and equal, with a normal reaction to light and in accommodation. The fundi were normal on ophthalmoscopic examination. The gingivae were spongy and bled easily. Small tonsillar nodes were present. Examination of the heart revealed

Read before the Clinical Pathological Conference at the Queen of Angels Hospital, Los Angeles, in September 1940.
Laboratory services were donated by Dr. A. H. Zeiler of the Zeiler, Hammack and Maner Clinical Laboratory.

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U. S. Medical College

ENDOCARDITIS—DRUCKMAN

JOUR. A. M. A.
JULY 12, 1941

a strong maximal cardiac impulse 6 cm. to the left of the midsternal line. An apical thrill was palpated. The heart was not enlarged to percussion. On auscultation the first sound at the apex was accentuated and blended with a short presystolic rough murmur and a long blowing systolic murmur which was transmitted to the axilla. A systolic aortic murmur was also heard. An electrocardiogram showed no abnormalities except sinus tachycardia. Neither the spleen, the liver nor the kidneys were found by palpation to be enlarged. The lungs were clear. The left extremity revealed a classic Osler node composed of several brownish purple petechiae in a 4 cm. area over the middorsal surface of the foot. The discoloration blanched partially on pressure, and the area was not painful. A similar but smaller spot was found on the external surface of the left knee joint. The reflexes were slightly hyperactive.

Course.—Because of her indigent status the patient was referred to the Los Angeles County General Hospital, where

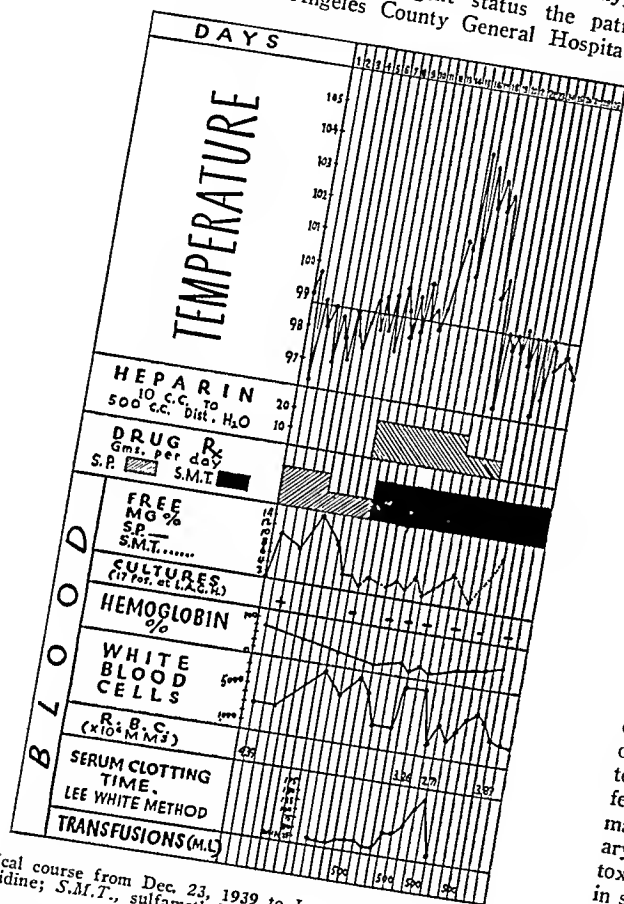
Kahn reactions were negative. The Osgood and Hyman method of intermittent intravenous drip of neoarsphenamine was instituted on November 11, in addition to the general symptomatic care. She received a total of 3.6 Gm. between November 11 and 14 inclusive. This therapy was discontinued following the development of a scarlatiniform rash over the trunk, joint pains, nausea, a generalized burning sensation and severe pains over the right side of the chest. Her temperature, which had ranged from 99 to 101 F., remained below 100 F. after this therapy. However, six blood cultures taken thereafter remained positive.

The patient, when seen later, stated that she could not stand or walk and still suffered numerous burning sensations in the extremities after this therapy. She was discharged from the hospital following an agreement to return to her legal residence in New York for further care. As she did not feel well enough to undertake a long journey she returned to my office. Physical examination, December 15, revealed no changes except a further loss in weight to 83 pounds (37.6 Kg.) and signs of a mixed arsenical polyneuritis. In addition to her former complaints she suffered from a sensation of "burning all over." A moderately severe ataxia confined her almost constantly to bed.

Owing to her brother's recent reemployment the patient could arrange admission to the Queen of Angels Hospital on December 23. It was decided to employ the therapy for subacute bacterial endocarditis as evolved by Kelson and White.¹ On admission sulfapyridine was given orally in a daily dose of 4 Gm. Although this was not well tolerated by the patient, its therapeutic effectiveness was demonstrated by the report of the first negative blood culture on December 31. Sulfamethylthiazole was substituted for sulfapyridine the following day and was given in a divided daily dose of 4 Gm. The gastrointestinal symptoms then subsided so that the patient could once more take nourishment. Heparin, 20 cc. in 1,000 cc. of distilled water, was given daily as a constant intravenous drip commencing December 30. Four 500 cc. transfusions of blood were given by the indirect citrate method on January 4, 8, 12 and 16. Prior to admission the patient had been febrile, her temperature ranging between 99.6 and 100.8 F. The temperature fell abruptly to normal on the second day of hospitalization, suggesting a swift sterilization of the blood. On January 6 a rapidly increasing and spiking temperature developed associated with chills. This reaction was undoubtedly due to a new lot of heparin.² When the dose of heparin was temporarily reduced on January 10, the temperature quickly fell to normal. It has remained generally brighter and free from toxic signs. She stated that there was a subjective increase in strength and well-being but still spoke of a burning sensation in her legs. The ataxia was unchanged.

Dr. S. J. Sperling examined the patient for her neurologic symptoms. He concluded that the history and neurologic changes definitely pointed to a peripheral neuritis of mixed sensory and motor character from which there had been considerable recovery. The sensory component was at the time of examination more definite, and the lower limbs had been and were the most involved. The peripheral neuritis appeared to have been of toxic infectious origin and it appeared from the history that the intravenous injection of neoarsphenamine was the important factor.

Laboratory examinations at the second hospitalization revealed the following: Hemoglobin ranged from 82 to 46 per cent, being 68 per cent on discharge. Red blood cells ranged from 4,390,000 to 2,710,000. A blood smear on admission revealed leukocytes which showed toxic changes. The smear appeared normal on discharge. The blood clotting time, by the Lee-White method, was taken daily beginning December 31. In spite of fairly accurate delivery of the heparin drip the clotting



Clinical course from Dec. 23, 1939 to Jan. 20, 1940 inclusive. S.P., sulfapyridine; S.M.T., sulfamethylthiazole.

she was admitted on Oct. 14, 1939 for emergency medical care, with a presumptive diagnosis of subacute bacterial endocarditis. The diagnosis was verified at the hospital by the report of a blood culture positive for *Streptococcus viridans* (five colonies per field) on October 16.

Thirteen more blood cultures taken at irregular intervals to November 28 were constantly positive. They generally tended toward an increasing bacterial count, the last few negative results, but on November 17, following intravenous drip therapy with neoarsphenamine, the urine turned darker and contained a rare red blood cell, an occasional white cell, a rare hyaline cast, a few fine granular casts and cylindroids. Four complete blood examinations revealed the following averages: hemoglobin was from 78 to 60 per cent (Sahli), red blood cells 3,240,000 to 4,200,000, white cells 5,750 to 7,950, polymorphonuclear leukocytes 62 to 89 per cent and lymphocytes 20 to 11 per cent, monocytes 9 to 4 per cent and basophils 2 per cent to 0. The corrected sedimentation rate was four and one-tenth minutes (Wintrobe). The Wassermann and

1. Kelson, S. R., and White, P. D.: A New Method of Treatment of Subacute Bacterial Endocarditis, *J. A. M. A.* 113: 1709 (Nov. 4) 1939.
2. Friedman, Meyer; Hamburger, W. W., and Katz, L. N.: Use of Heparin in Subacute Bacterial Endocarditis, *J. A. M. A.* 113: 1703 (Nov. 4) 1939.

time varied considerably, ranging from fifteen to two hundred and thirty-eight minutes for the blood serum. Apparently the variations were due to the unstandardized unit potency of the heparin. Blood culture was positive for *Streptococcus viridans* on December 23, numerous colonies being found. However, on December 31 the blood cultures converted to normal and have remained so until the present, eighteen months later, the time of this report. Sulfapyridine and then sulfamethylthiazole blood levels were calculated daily. Urinalyses were essentially negative except for a heavy trace of albumin on January 8, during the height of the heparin reaction.

The patient returned to her home after discharge from the hospital Jan. 20, 1940, at which time all therapy was discontinued. She was placed on a high caloric diet and given thiamine hydrochloride intravenously every other day in doses of 20 to 40 mg. The patient continued to regain her strength and gain weight. Three weeks after discharge she had her first menstrual period in eight months and has since had regular periods. The ataxia gradually improved so that now the patient walks moderately well. She has shown a gain of 25 pounds (11.3 Kg.), now weighing 108 pounds (49 Kg.). Periodic examination of the heart fails to show any notable change in the character of the heart murmurs except that they are more constant in quality. The patient does light work in the home and states that she feels as well as she did a year ago with the exception of the mild locomotor difficulty. Blood cultures taken at approximate monthly intervals since discharge from the hospital have consistently remained negative for *Streptococcus viridans*.

COMMENT

An analysis of the therapy in this case suggests the probability that the success of the treatment would have occurred without the use of heparin. The febrile course was interrupted on the first day following commencement of sulfapyridine. The first negative blood culture was reported prior to the use of heparin. Of five patients reported by Kelson and White¹ to have survived heparin treatment, only one had a positive blood culture at the beginning of heparinization. In this case no improvement occurred. The use of heparin, by greatly diminishing the clotting properties of the blood, has caused fatalities due to cerebral hemorrhages and emboli affecting vital functions. In addition, the possibility of overwhelming bacteremia by the sudden release of large quantities of bacteria from a disintegrated vegetation and the danger of febrile reactions in a weakened patient² makes heparin a double edged sword. Further, if heparin could be discontinued it would save considerable inconvenience and expense to the patient. A review of the cases reported in the literature has been given recently by Lichtman and Bierman.³ It was shown that 3 per cent may represent the highest probable estimate for the incidence of spontaneous recovery.⁴ In 200 cases of subacute bacterial endocarditis collected from the literature recovery occurred in 12, an incidence of 6 per cent.³ Kelson and White reported 3 cases of apparent cure with their combined method of sulfapyridine and heparin. Later they⁵ show 4 recoveries among 26 patients who were treated. Of a total of 25 patients treated by chemotherapy combined with hyperthermia by Lichtman and Bierman, 4 recovered, an incidence of 16 per cent.³ Solomon⁶ has developed a method of using chemotherapy fortified by hyperpyrexia induced by typhoid paratyphoid vaccine. This was employed in 17 cases, with 5 recoveries.

Although the combined methods of therapy seem to offer hope for a greater incidence of recovery, the basis of the therapy remains the use of sulfonamide derivatives. The number of cases thus far studied are too small for any definite conclusions to be made. The same method is encouraging in the hands of one investigator and gives poor results when tried by another.

3. Lichtman, S. S., and Bierman, William: The Treatment of Subacute Bacterial Endocarditis, *J. A. M. A.* **116**: 286 (Jan. 25) 1941.

4. Libman, Emanuel: A Further Report on Recovery and Recurrence in Subacute Bacterial Endocarditis, *Tr. A. Am. Physicians* **48**: 44, 1933.

5. Kelson, S. R., in discussion on Conference of the Medical Services on Results in the Treatment of Subacute Bacterial Endocarditis by Recent New Methods, Mount Sinai Hospital, New York, May 15, 1940.

6. Solomon, H. H.: Subacute Bacterial Endocarditis: Treatment with Sulfapyridine and Intravenous Injections of Typhoparatyphoid Vaccine, *New York State M. J.* **41**: 45 (Jan. 1) 1941.

Swain, as quoted by Fletcher,⁷ using *in vitro* tests in support of clinical observations, demonstrated that some strains of *Streptococcus viridans* are susceptible to sulfapyridine while others are unaffected. One might, therefore, venture the thought that cure depends on the immune reactions of the host in relation to the susceptibility of *Streptococcus viridans* to sulfonamide derivatives, e. g. cure may result in these cases in which there are high immunologic titers and in which *Streptococcus viridans* is susceptible to the action of sulfonamide derivatives. It is probable that both ends of these variables are potentiated by the use of pyretotherapy.

The arsenical polyneuritis which followed the use of neoarsphenamine therapy has not completely cleared up after treatment with thiamine hydrochloride. The use of vitamin B₆ (pyridoxine) in this complication, as recently reported,⁸ has been instituted. Since the polyneuritic complication, along with others, is fairly frequent, in neoarsphenamine drip therapy,⁹ its use in this condition is questionable.

SUMMARY

1. A proved case of subacute bacterial endocarditis has shown symptomatic improvement and negative blood cultures for eighteen months following the use of sulfapyridine, sulfamethylthiazole and heparin.

2. Therapy is probably effective only in those cases of subacute bacterial endocarditis in which *Streptococcus viridans* is susceptible to the action of sulfonamide derivatives.

3. In such cases sulfonamide derivatives may be effective without the use of heparin.

1048 Temple Street.

Special Article

GLANDULAR PHYSIOLOGY AND THERAPY

CLINICAL SIGNIFICANCE OF HORMONE ASSAYS

S. CHARLES FREED, M.D.

Member of Headquarters Staff, Council on Pharmacy and Chemistry
CHICAGO

This special article is published under the auspices of the Council on Pharmacy and Chemistry. It is one of a series which will be published in book form as the second edition of "Glandular Physiology and Therapy." The opinions expressed in this article are those of the author and do not necessarily represent the views of the Council.—Ed.

Studies of the hormonal content of urine, blood and tissues are of significant value only when considered in relation to the clinical history, physical findings and other laboratory data of the patient. There are few tests which when considered apart from other evidence can be used safely for diagnostic purposes. In the past several years intensive investigations have pointed to the variability and complexity of tests performed for the purpose of diagnosing endocrine conditions. The results are complicated by the fact that the different laboratories vary in their technics and that there are factors of many sorts over which little control can be exercised and which interfere with the accumulation of uniform data. Definite progress has been made, however, by the use of biochemical procedures, in determining the quantities of certain hormonal substances. This advancement has

7. Fletcher, C. M.: Subacute Bacterial Endocarditis Treated with Sulfapyridine and Heparin, *Lancet* **2**: 512 (Oct. 26) 1940.

8. Vilter, R. W.; Aring, C. D., and Spies, T. D.: A Case of Arsenic Peripheral Neuritis Treated with Synthetic Vitamin and Alpha-Tocopherol, *J. A. M. A.* **115**: 209 (July 20) 1940.

9. Hyman, H. T.; Chargin, Louis; Leifer, William: Massive Dose Arsenotherapy of Syphilis by the Intravenous Drip Method, *Am. J. Syph., Gonorr. & Ven. Dis.* **23**: 685 (Nov.) 1939.

been especially marked in assaying the numerous steroids of the ovary, testis and adrenal cortex.

In recent years, biochemical and physiologic studies have indicated hitherto undreamed of relationships of such steroids. At the present time, while much of this investigation is of little practical value, it points to the possibility that the future will reveal an understanding of certain dysfunctions which up to the present time have remained obscure. While most of such investigations require extensive laboratory facilities, it is definitely worth while that the physician follow the reports of investigators who have such facilities in order to appreciate more fully not only the diagnostic value of the results but the possibility of understanding the etiology of the disturbances and the bases for various therapeutic procedures.

ANTERIOR LOBE OF THE PITUITARY

The pituitary is a remarkably complex organ with numerous hormonal secretions. Tests for the function of the anterior lobe of this organ should therefore be aimed at a specific function, avoiding conclusions concerning the general activity of the gland on the basis of results obtained on the secretion of one component.

The gonadotropic factors of the anterior lobe of the pituitary have been given most attention by experimenters, probably because dysfunctions of the reproductive organs are the most common endocrine disturbances encountered and because bioassays for these factors are relatively simple. Numerous reports on analyses of urine and blood for gonadotropic substances have appeared in the past few years. The results of these investigations have not been of great practical importance as yet, since efforts have been directed mainly at obtaining normal values, and it is only lately that fairly accurate data on normal individuals have been obtained. The recently devised mouse or rat uterus test for gonadotropin may result in more satisfactory studies of the excretion of gonadotropic factors.¹

It is necessary, of course, to determine the values of the gonadotropic substances excreted in normal individuals before conclusions may be drawn as to any possible dysfunctions. It seems fairly certain that in children little or no gonadotropic substance is excreted except before the onset of puberty, when appreciable amounts may be found. Methods in which urine is concentrated a hundredfold are necessary to detect the gonadotropic activity.² In the normally menstruating woman, according to the evidence presented in the earlier literature, the excretion of gonadotropin is insignificant except at the midinterval stage, on the average between the twelfth and sixteenth days.³ It was assumed by several investigators that the peak in excretion at the middle of the menstrual cycle indicated ovulation. Others were unable to confirm these results.⁴ From the data of the

latter observers it was concluded that an increased excretion of gonadotropin could be obtained at any point during the month, but that a consistent rise in output preceded the menstrual flow. There is additional evidence that an increased amount of gonadotropin is not always found at the midinterval. For instance, D'Amour and co-workers⁵ reported on daily tests for urinary gonadotropin in 50 complete menstrual cycles; their results were as follows: during (a) 3 cycles there was no response, (b) 21 cycles there was one response between the thirteenth and sixteenth days, (c) 2 cycles there was one positive response on the nineteenth day, (d) 13 cycles there were two responses with a six to twelve day interval, (e) 2 cycles there were two responses very close together and (f) 9 cycles there were three responses at fairly regular intervals. These workers concluded that either ovulation may occur more than once during the menstrual cycle or ovulation is not directly dependent on the amount of gonadotropin in circulation. Von Haam⁶ investigated the daily gonadotropin excretion of 3 women and his conclusions are quite similar. It is therefore apparent that the interpretation of assays for gonadotropin in menstruating women is not, as yet, clear of confusing elements.

Such determinations are of some value in regard to nonpregnant women with amenorrhea. It is well established that in the complete absence of ovarian function in adult women there is an increased excretion of gonadotropin.⁷ Thus, in amenorrhea due to ovarian failure, spontaneous menopause or surgical castration, increased amounts of gonadotropin are present in blood and urine. The increase in urinary gonadotropin may be detected within as little as three days following ovariectomy.⁸ Even in patients without ovaries, however, the excretion fluctuates significantly from day to day, necessitating repeated tests at times, before conclusions may be drawn as to whether or not any particular patient has ovarian failure. Such tests are of some value, therefore, in determining whether the pituitary or the ovary is at fault in cases of amenorrhea. If the absence of menstruation is due to failure of the pituitary, little or no gonadotropin will be excreted; if the ovaries are at fault, this substance will be found in most cases on thorough investigation. Similarly, there may be some increase in the amounts of gonadotropin excreted in males in whom testicular function is low or absent if the pituitary is normal, but these amounts are not easily measured. Possibly the more sensitive tests in which rat or mouse uteri are used will yield more information in questionable states of testicular activity or borderline hypogonadism.

It has been reported that the thyrotropic principle of the anterior lobe may be detected in the urine and blood of animals. The amount is apparently increased following thyroidectomy, analogous to the increase in gonadotropin excreted after castration. The use of thyrotropic hormone assays in the clinic has been somewhat limited owing to the variability of the results of different

1. Levin, L., and Tyndale, H. H.: The Quantitative Assay of "Follicle Stimulating" Substances, *Endocrinology* 21: 619 (Sept.) 1937.

2. Katzman, P. A., and Doisy, E. A.: A Quantitative Procedure for Determining Normal Excretion of Prolan, *Proc. Soc. Exper. Biol. & Med.* 30: 1188 (June) 1933.

3. Frank, R. T.: Sex-Endocrine Factors in Blood and Urine in Health and Disease, in *Glandular Physiology and Therapy*, Chicago, American Medical Association, 1935, chap. 16, p. 219. Frank, R. T., and Salmon, U. J.: Gonadotropic Blood and Urine Cycles in Normal Menstruating Woman, *Proc. Soc. Exper. Biol. & Med.* 32: 1237 (May) 1935. Kurzrok, R.; Kirkman, J. J., and Creelman, M.: Studies Relating to the Time of Human Ovulation, *Am. J. Obst. & Gynec.* 28: 319 (Sept.) 1934. Freed, S. C.: Gonadotropic Substance in Urine of Normal Children, *Proc. Soc. Exper. Biol. & Med.* 33: 35 (Oct.) 1935.

4. Albright, F.; Halsted, J. A., and Cloney, E.: Studies on Ovarian Dysfunction: I. The Hormonal "Measuring Sticks" Available for Clinical Use and Values Obtained on Normal Individuals, *New England J. Med.* 212: 192 (Jan. 31) 1935. Smith, G. V., and Smith, O. W.: The Urinary Excretion of Estrogenic and Gonadotropic Hormones During Menstrual Cycles, the Period of Conception and Early Pregnancy, *ibid.* 215: 908 (Nov. 12) 1936.

5. D'Amour, F. E.; Funk, D., and Liverman, H.: Daily Gonadotropic Hormone Tests During Fifty Complete Menstrual Cycles, *Am. J. Obst. & Gynec.* 37: 940 (June) 1939.

6. Von Haam, E.: The Direct and Indirect Determinations of Estrogenic and Gonadotropic Hormones, *Am. J. Clin. Path.* 10: 205 (March) 1940.

7. Zondek, B.: Ueber die Hormone des Hypophysenvorderlappens: I. Die Follikelhormone (Prolan A)—Klimakterium—Kastration, *Klin. Wochenschr.* 1930. Fluhmann, C. F.: Significance of Gonadotropin in Blood of Gynecologic Patients, *Am. J. Obst. & Gynec.* 1930.

8. Salmon, U. J.; Geist, S. H., and Walter, R. I.: Inhibitory Effect of Implanted Estrogenic Hormone Crystals upon Post-Menopause and Castration Hypophysis of Women, *Proc. Soc. Exper. Biol. & Med.* 45: 424 (Feb.) 1940.

investigators. In myxedema an increased elimination of thyrotropic substance has been observed by several investigators. The blood of such patients is also claimed to be rich in this principle while little, if any, is found in the opposite state of hyperthyroidism. With regard to acromegaly, there is a difference of opinion as to whether there is increased excretion, while in Simmonds's disease the excretion is claimed to be below normal. Practical use of this test is not very great inasmuch as considerable technical facilities are required. A further complication has arisen, since recent work indicates that the thyrotropic principle may be separated into two factors; one which stimulates the growth of the thyroid gland and one which stimulates the secretion of the thyroid hormone. Further work will be necessary in order to correlate such findings with clinical disturbances.⁹

The detection of other principles of the pituitary in the tissues of the body is still highly experimental. The status of the parathyrotropic hormone has not progressed beyond that of several years ago, at which time a few reports indicated the presence of such a principle in the urine of women in pregnancy and in that of patients with hyperplasia of the parathyroid glands. Several investigators have been able to detect a contrainsular hormone, a principle of the anterior lobe which antagonizes the action of insulin. Serum or urine extracts have been administered to animals with the induction of resistance to insulin. Speculation on this subject indicates that a substance like the diabetogenic substance or contrainsular factor may be responsible for the insulin resistance of some patients with diabetes.¹⁰ The secretion of this substance is stimulated by the ingestion of fat and reduced by the ingestion of carbohydrates. The lactogenic hormone is found increased in women post partum.¹¹ Lyons¹² has indicated that the lactogenic substance can be demonstrated in the urine of normally menstruating women. These findings have not been utilized as yet for clinical studies.

POSTERIOR LOBE OF THE PITUITARY

Recent work has renewed interest in studies of posterior lobe hormones in the body fluids of animals. Gilman and Goodman¹³ have shown that rats deprived of water will excrete the antidiuretic principle of the posterior lobe. There has been a considerable amount of work on the subject of antidiuretic and pressor principles in the body fluids and their detection in eclampsia, hypertension and other states. Much of the earlier work has never been satisfactorily confirmed and, according to a number of investigators, has been rather adequately disproved. More recent investigations indicate the possibility for study of the activity of the posterior lobe in clinical states. Thus, Teel and Reid¹⁴ have shown that concentrates of urine from women with eclampsia or preeclampsia had powerful antidiuretic effects when injected into rats. Normal pregnancy urine extracts had no such effect, although when pregnant women were deprived of water they excreted an antidiuretic substance.

9. A discussion of this phase will be found in the section on adrenotropic, thyrotropic and parathyrotropic factors, chapter 3.

10. Himsworth, H. P.: *The Mechanism of Diabetes Mellitus* (Goulstonian Lecture), *Lancet* 2: 65 (July 8) 1939.

11. Lyons, W. R., and Page, E.: Detection of Mammotropin in the Urine of Lactating Women, *Proc. Soc. Exper. Biol. & Med.* 32: 1049 (April) 1935.

12. Lyons, W. R.: Personal communication to the author.

13. Gilman, A., and Goodman, L.: The Secretory Response of the Posterior Pituitary to the Need for Water Conservation, *J. Physiol.* 90: 113 (July 15) 1937.

14. Teel, H. M., and Reid, D. E.: Observations upon the Occurrence of an Antidiuretic Substance in the Urine of Patients with Pre-Eclampsia and Eclampsia, *Endocrinology* 24: 297 (March) 1939.

GONADS

The last few years have seen considerable progress in the investigations on the excretion of sex hormones. Refinements of method have made assays more dependable, but by far the greatest progress has been due to the biochemical studies in this field. Especially significant has been the work on the relationship of the various steroids of the gonads and adrenal cortex. At the present time much of the data is complicated and confusing. Many factors influence the excretion of these principles. It is acknowledged that the quantitative excretion of these substances does not necessarily indicate the activity of the various glands, since several of these steroids, for instance, are elaborated by more than one tissue. Consideration must be made of the rate of the utilization of these substances, of their conjugation and of their destruction in the liver and metabolic fate. It is, furthermore, no longer accurate to refer to "male" or "female" sex hormone excretions. Androgens are excreted by both women and men; estrogens are similarly excreted by both sexes. In addition, both androgens and estrogens have been isolated from the adrenal cortex, as has been progesterone. These compounds have a basic skeletal structure and many have common physiologic properties to a varying degree. It is obvious, therefore, that simple biologic tests have only a limited value. There is also evidence that certain androgens arise chiefly from the gonads while others arise from the adrenal cortex. These can be detected by biochemical procedures only. The possibility of differentiating between tumors of the ovaries, pituitary and adrenals may, therefore, be likely and, in spite of the complexities of the present studies, it is most encouraging that from the accumulation of data may come definite practical help to the clinician in the diagnosis and treatment of certain endocrine diseases.

Ovaries.—In order to appreciate data on estrogen assays, it is essential that the factors determining the excretion of these substances be understood. The greater portion of endogenous or exogenous estrogen is destroyed by the liver and cannot be recovered. The metabolism of estrogens in some animals may be influenced by progesterone. According to Pincus and Zahl,^{15a} and Smith and Smith,^{15b} the corpus luteum or exogenous progesterone prevents excessive destruction of estrogens. In addition, the liver conjugates much of the estrogens to glucuronides and possibly other compounds, the so-called combined estrogens. Hydrolysis of the urine with hydrochloric acid is necessary to free the estrogens from such a combination. The intrinsic metabolism of estrogens is quite complicated. According to Pincus and Zahl, estradiol (dihydrotheelin) in the rabbit is converted to estrone (theelin), a reversible reaction, while estrone is converted to estriol (theolol) in the presence of the uterus, an irreversible reaction, which is facilitated by progesterone. These relationships may therefore account for the finding in human urine of estrone, estriol and estradiol. It should be understood that other steroids may be converted in part to estrogens.

Despite the numerous factors influencing the excretion of estrogens, the activity of the ovaries may be measured to some extent by examining the estrogenic substances of the urine. Results with blood assays for

15. (a) Pincus, G., and Zahl, P. A.: The Biogenesis of Primary Sex Hormones: I. The Fate of Estrins Injected into the Rabbit, *J. Gen. Physiol.* 20: 879 (July) 1937. (b) Smith, G. V., and Smith, O. W.: Observations Concerning the Metabolism of Estrogens in Women, *Am. J. Obst. & Gynec.* 36: 769 (Nov.) 1938.

estrogens are most unsatisfactory, owing to the small amounts available in circulating blood. Pioneer work in the field of urinary estrogen assays was done by Robert Frank and co-workers. This group described a biphasic curve of estrogen excretion in the normal woman. One peak appeared at the midperiod and the other before the menses, with a rapid drop in estrogen excretion preceding the flow. A number of competent investigators have been able to confirm this work.¹⁶ Despite the fact that the assay method used by Frank and co-workers did not at first utilize the hydrolysis of urine for liberating bound estrogens, recent elaborate studies based on daily urine specimens have indicated that most normally menstruating women have a more or less sharply defined biphasic curve for estrogen excretion.¹⁷ The curves resemble only approximately those which Frank described. There is considerable variation in the shapes of the consecutive monthly graphs obtained from a woman. The peaks vary in their height, and the distance between the two peaks may show a considerable variation. It is significant that the day to day excretion of estrogens may fluctuate tremendously, and pooling urine for two or three days levels off a peak or obscures the shape of a curve. Gustavson and associates¹⁷ considered that the first peak might indicate ovulation and the second peak activity of the corpus luteum. With this conception, these investigators stated that since there is no constant relationship between the two peaks and the next menstruation, the time of ovulation may vary considerably in the same subject and the corpus luteum may require varying lengths of time to reach full development. Otherwise they must conclude that the peaks of estrogen excretion have no particular relationship to ovulation or corpus luteum activity. Furuhielm^{18a} reached the same conclusion on the basis of urinary assays of estrogens in normal women. Nevertheless, Werner^{18b} offers a somewhat different interpretation on the basis of his results in measuring simultaneously the estrogen and gonadotropin excretions in normal women. He confirmed much of the previous work in finding that there is a sudden increase in the amount of gonadotropin excreted at the midinterval and frequently at other times during the cycle, and that the estrogen excretion curve has peaks at midinterval and during the premenstrual period. He observed, however, that in almost every curve at the midinterval a peak of gonadotropin excretion coincided with a peak of estrogen excretion. The uniformity of the results and the finding of pregnandiol shortly thereafter suggested to him that ovulation occurred at these times.

A recent study by Darby and Childs¹⁹ revealed the interesting fact that there are seasonal fluctuations in the estrogen excretion of normal menstruating women, the greatest excretion usually occurring in the spring.

With the development of biochemical procedures for the assaying of estrogens, studies in this field have revealed interesting data. The investigations of the Smiths and their associates^{16b} have been most extensive in this regard. According to this group, estriol is excreted by normal women in addition to those who are pregnant. Estriol was found in the urine in greatest quantities during the luteal phase, which probably accounts for the second peak of estrogen excretion, while estrone was most abundant during the follicular phase. The total estrogenic activity of urinary extracts could not be accounted for by adding the estrogenicity of these two substances. It was concluded that the remaining activity was due to an "x" estrogen, and it was suspected that this "x" estrogen was estradiol. This estrogen was detected in greatest quantities in the follicular phase of the menstrual cycle. It has been recently demonstrated conclusively that the "x" estrogen in pregnancy urine is estradiol,²⁰ and there remains little doubt that estradiol is present in the nonpregnant woman's urine. David²¹ has confirmed this work by also identifying estradiol in pregnancy urine. This brilliant series of investigations on fundamental ovarian physiology was anticipated in animal work to some extent by the demonstration of MacCorquodale and associates that both estrone and estradiol are present in sows' ovaries, and by the work of Freed and associates, who postulated on the basis of histologic changes that rat ovaries secrete two or more estrogens.

In young girls the estrogen excretion is insignificant until the time of puberty.²² In menopausal women, likewise, the estrogen excretion is small, but approximately 5 rat units of estrogen are consistently found in the urine of menopausal and castrate women. It has been suggested that this estrogen is derived from the adrenal cortex. In cases of the common ovarian dysfunctions estrogen determinations have not been satisfactory for clinical use. In such conditions as dysmenorrhea or metrorrhagia there is no typical pattern in the curve of estrogen excretion, although early reports indicated that there might be an increased yield in the urine of women with functional bleeding. Frank^{23a} and associates demonstrated that in women who complain of premenstrual distress, nervousness, psychic disturbances, headaches, gastrointestinal upsets and other symptoms there is a rise of the serum level of estrogens preceding menstruation. A study of the estrogen excretion in women with amenorrhea has some significance. Frank has obtained in such cases three types of curves, representing (1) absence of excretion, (2) diminished or almost normal excretion and (3) increased excretion of estrogenic substances. He has suggested that other factors besides an abnormal elaboration of estrogen by the ovaries may be responsible for functional amenorrhea and has hinted that a disturbance of the ratio between estrogens and androgens might be a factor. Albright and Halsted^{23b} have described similar curves of estrogen excretion in amenorrhea.

16. (a) Gallagher, T. F.; Peterson, D. H.; Dorfman, R. I.; Kenyon, A. T., and Koch, F. C.: Daily Urinary Excretion of Estrogenic and Androgenic Substances by Normal Men and Women, *J. Clin. Investigation* **16**: 695 (Sept.) 1937. (b) Smith, G. V.; Smith, O. W., and Pincus, G.: Total Urinary Estrogen, Estrone and Estriol During a Menstrual Cycle and a Pregnancy, *Am. J. Physiol.* **121**: 98 (Jan.) 1938. (c) Von Haam E., and Rothermich, N. O.: Excretion of Gonadotropin and Estrogen Hormones in Urine During Normal Menstrual Cycle, *Proc. Soc. Exper. Biol. & Med.* **44**: 369 (June) 1940.

17. Gustavson, R. G.; Mason, L. W.; Hays, E. E.; Wood, T. R., and D'Amour, F. E.: The Quantitative Determination of Estrogenic Substances in Normal Female Urine During the Menstrual Cycle, *Am. J. Obst. & Gynec.* **35**: 115 (Jan.) 1938.

18. (a) Furuhielm, M.: Excretion of Oestrogenic and Androgenic Substances in the Urine of Women, *Acta obst. et gynec. Scandinau.* (suppl. 1) **20**: 1, 1940. (b) Werner, S. C.: Quantitative Study of Urinary Excretion of Hypophyseal Gonadotropin, Estrogen and Androgen of Normal Women, *J. Clin. Investigation* **20**: 21 (Jan.) 1941.

19. Darby, H. H., and Childs, D.: Seasonal Fluctuation in Estrogen Excretion, *Science* **93**: 115 (Jan. 31) 1941.

20. Huffman, M. N.; MacCorquodale, D. W.; Thayer, S. A.; Doisy, E. A.; Smith, G. V., and Smith, O. W.: The Isolation of a Dihydrotheelin from Human Pregnancy Urine, *J. Biol. Chem.* **134**: 591 (July) 1940.

21. David, K. G.: Die Identifizierung von Oestradiol im Schwangersenurine, *Acta brev. Neerland.* **10**: 30, 1940.

22. Dorfman, R. I.; Greulich, W. W., and Solomon, C. I.: The Excretion of Androgenic and Estrogenic Substances in Urine of Children, *Endocrinology* **21**: 741 (Nov.) 1937.

23. (a) Frank, R. T.: The Sex Hormones: Their Physiologic Significance and Use in Practice, *J. A. M. A.* **114**: 1804 (April 20) 1940. (b) Albright, F., and Halsted, J. A.: Studies of Ovarian Dysfunction: II. The Application of the "Hormonal Measuring Sticks" to the Sorting Out and to the Treatment of the Various Types of Amenorrhoea, *New England J. Med.* **212**: 250 (Feb. 7) 1935.

A high estrogen excretion has been suspected and found in cases of certain ovarian tumors, principally those of the granulosa cell type. Actually a number of assays of granulosa cell tumors themselves revealed surprisingly low yields of estrogen to account for the extreme degree of endometrial hyperplasia usually found. Palmer²⁴ reported the greatest amount of estrogen in a granulosa cell tumor: an equivalent of 2,000 international units of estrone per kilogram of fresh tissue. The urine contained correspondingly large amounts of estrogen. Other ovarian tumors, including different types of cysts, have been analyzed for estrogens, but no consistent results have been obtained.

Assays of androgen in the urine of women have been made as a method of measuring ovarian function. Theoretically, it is possible for the ovaries to secrete androgen since this action has been demonstrated in the mouse under certain experimental conditions. Furthermore, an ovarian tumor (arrhenoblastoma) in woman secretes androgens, as evidenced by its masculinizing effect, and in addition the hilus of the normal ovary contains cells with potentially androgenic properties. Androgen assays indicate that essentially only small amounts, if any, are secreted by the ovary, since women who have had their ovaries removed or who have spontaneous menopause excrete considerable amounts of androgens. The androgens are probably derived from the adrenal cortex. Nevertheless, there is some evidence that women with ovarian dysfunctions excrete abnormal amounts of androgen. Women excrete varying quantities of androgens which may approximate the amounts found in the urine of normal males²⁵ but which are on the average somewhat less. The excretion of androsterone and other 17-ketosteroids is rather uniform throughout the menstrual cycle. Callow and Callow²⁶ claimed the excretion was somewhat higher at the beginning of the menstrual cycle. Gallagher and associates^{16a} could detect no pattern in the monthly excretion of androgens, the daily yield fluctuating from 1.3 to 4.6 milliequivalents of androsterone according to the capon method. Furuhielm^{18a} reported that the androgen excretion curve in normal women paralleled roughly the peaked estrogen excretion except that the androgen values were high during menstruation, at which time the estrogen excretion was very low. Hamblen, Cuyler and Baptist²⁷ reported a lowering of androgen excretion during menstrual bleeding. Werner,^{18b} however, found a consistent output of androgens throughout the menstrual cycle, there being only a minor variation from the mean even over several menstrual cycles. According to Hamblen and associates,²⁸ studies on androgen excretion in patients with ovarian dysfunctions have revealed significant findings. Hamblen, Pattee and Cuyler^{28a}

found that during the menopause the average daily amount of androgen excreted was elevated from the normal of 3.4 to 8.4 mg. In hypo-ovarianism the values were 7.0 mg. daily and in menorrhagia about 6.0 mg. In women whose breasts were recently painful with the menstrual cycle the daily androgen excretion averaged 5.1 mg., in women with functional dysmenorrhea 6.6 mg. and in women with "menstrual headaches" 5.8 mg. It is interesting that estrogen administration lowered these values somewhat.

In cases of virilism without gross pathologic changes in the adrenals, there is little increase in the androgen excretion.²⁹ In such cases the androgen output may occasionally be greater than normal but is considerably less than the yields observed in cases in which the adrenal cortex shows lesions.

Assays for progesterone in the blood or urine of man and other animals have until recently never been practical, owing to the fact that these fluids contain insufficient amounts of this substance for testing by the usual biologic methods. Several liters of blood or urine would be required to furnish sufficient progesterone to induce an endometrial response in a single rabbit by the Corner-Allen method. Recently a more sensitive method has been used to detect progesterone in a few cubic centimeters of blood.³⁰ The material to be assayed is introduced directly into the rabbit uterus, and the endometrial response is obtained with relatively minute amounts of progesterone. Haskins³¹ has reported finding progesterone in the serum of pregnant women. No practical applications have been as yet reported.

Within the past few years progesterone secretion has been measured by an indirect method. It has been conclusively shown that pregnandiol is a metabolic derivative of progesterone.³² This substance occurs in the urine of normal women and in increased amounts during pregnancy. In the urine it occurs as sodium pregnandiol glycuronide, although there are small amounts of free pregnandiol, perhaps because of spontaneous hydrolysis of the urine specimen. In the normal cycle, sodium pregnandiol glycuronide is present in the urine during the corpus luteum phase. The daily excretion of this substance varies considerably, but the average is about 3 to 4 mg. daily. The total amount of this substance in the urine during a luteal phase may be from 3 to 60 mg. On the occurrence of menstruation, pregnandiol disappears from the urine. Pregnanediol assays are of value at the present time in investigations of the causes of ovarian dysfunctions. The wide fluctuations in the excretion of this substance prevent the quantitative application of such assays for practical purposes.³³

24. Palmer, A.: Estrogenic Hormone in the Urine and Tumor of a Patient with a Granulosa Cell Tumor of the Ovary, *Am. J. Obst. & Gynec.* **37**: 492 (March) 1939.

25. (a) Kenyon, A. T.; Gallagher, T. F.; Peterson, D. H.; Dorfman, R. I., and Koch, F. C.: Urinary Excretion of Androgenic and Estrogenic Substances in Certain Endocrine States: Studies in Hypogonadism, Gynecostasia and Virilism, *J. Clin. Investigation* **16**: 705 (Sept.) 1937. (b) Dingemans, E.; Boelchardt, H., and Laqueur, E.: Capon Comb Growth-Promoting Substances ("Male Hormones") in Human Urine of Males and Females of Varying Ages, *Biochem. J.* **31**: 500 (April) 1937. (c) Baumann, E. J., and Metzger, N.: Colorimetric Estimation and Fractionation of Urinary Androgens, *Endocrinology* **27**: 664 (Oct.) 1940. (d) Gallagher and others.^{16a}

26. Callow, N. H., and Callow, R. K.: The Isolation of 17-Ketosteroids from the Urine of Normal Women, *Biochem. J.* **33**: 931 (June) 1939.

27. Hamblen, E. C.; Cuyler, W. K., and Baptist, M.: Urinary Androgens and Uterine Bleeding, *Endocrinology* **27**: 16 (July) 1940.

28. (a) Hamblen, E. C.; Pattee, C. J., and Cuyler, W. K.: Alteration of Urinary Excretion of Androgens by Estrogenic Therapy, *Endocrinology* **27**: 734 (Nov.) 1940. (b) Hamblen, E. C.: Rationale of Androgen Therapy in Gynecology, *J. Clin. Endocrinol.* **1**: 180 (Feb.) 1941.

29. (a) Talbot, N. B.; Butler, A. M., and MacLachlan, E. A.: Alpha and Beta Neutral Ketosteroids (Androgens): Preliminary Observations on Their Normal Urinary Excretion and the Clinical Usefulness of Their Assay in Differential Diagnosis, *New England J. Med.* **223**: 369 (Sept. 5) 1940. (b) Kenyon and co-workers.^{25a} (c) Baumann and Metzger.^{25c}

30. McGinty, D. A.; Anderson, L. P., and McCullough, N. B.: Effect of Local Application of Progesterone on Rabbit Uterus, *Endocrinology* **24**: 829 (June) 1939. de Allende, I. L. C.: Blood Progesterone During Sexual Cycle of Macaca Rhesus: Quantitative Assay, *Proc. Soc. Exper. Biol. & Med.* **44**: 534 (June) 1940. Haskins, A. L., Jr.: Modification of the Intrauterine Assay Method for Progesterone, *Endocrinology* **27**: 983 (Dec.) 1940.

31. Haskins, A. L.: Assay of Blood of Pregnant Women for Progesterone, *J. Clin. Endocrinol.* **1**: 65 (Jan.) 1941.

32. Venning, E. H., and Browne, J. S. L.: Studies on Corpus Luteum Function: I. The Urinary Excretion of Sodium Pregnanediol Glycuronide in the Human Menstrual Cycle, *Endocrinology* **21**: 711 (Nov.) 1937; Study of Metabolism of Crystalline Progesterone, *ibid.* **27**: 707 (Nov.) 1940.

33. Hamblen, E. C.; Ashley, C., and Baptist, M.: Sodium Pregnanediol Glycuronide: The Significance of Its Excretion in the Urine, *Endocrinology* **24**: 1 (Jan.) 1939. Buxton, C. L.: Pregnanediol Determination as an Aid in Clinical Diagnosis, *Am. J. Obst. & Gynec.* **40**: 202 (Aug.) 1940. Bachman, C.; Leekley, D., and Hirschmann, H.: Excretion of Sodium Pregnanediol Glycuronide in Urine of Normal Human Pregnancy, *J. Clin. Investigation* **19**: 801 (Nov.) 1940.

There is a definite relationship between the metabolism of progesterone and the state of the endometrium. At one time it was claimed that the endometrium was necessary for the conversion of progesterone to pregnandiol; later it was shown that the endometrium is not essential to this reaction³⁴ but aids materially in the conversion of progesterone to pregnandiol. The role of the endometrium in the metabolism of the ovarian steroids may prove to be of considerable significance in those common ovarian disorders which still remain unexplained. In addition to the state of the endometrium, other factors influencing the conversion of progesterone to sodium pregnandiol glycuronide and the excretion of the substance are the liver, kidney and its metabolic relationships with other steroidal hormones. Since progesterone is also elaborated by the adrenal cortex, pregnandiol may be found in minute quantities in the urine of castrate women and in that of men.³⁵

Testes.—The activity of the testes may be measured within certain limits by the excretion of androgens in the urine. At the present time the values for the androgens excreted are in somewhat of a confused state inasmuch as the recent data have been obtained with biochemical assay methods rather than the capon method. The colorimetric methods of assay cannot distinguish between the ketosteroids which do not have androgenic activity and those which do. The values obtained with colorimetric procedures are usually two to three times as great as those with the use of the capon assay method. The presence of interfering substances and other chromogenic materials has resulted in variations in results as obtained by different investigators. Nevertheless, for practical purposes there appears to be satisfactory correlation between the capon and the colorimetric assays. The androgens found in normal male urine are principally androsterone and dehydroandrosterone. The latter has about one-fourth the androgenic activity of androsterone, but both give an equal intensity of color when tested by the Zimmerman colorimetric reaction. The ketosteroid etioallocholanolone is found in quantities approximately equal to those of androsterone. It gives a color reaction but has little androgenic activity. In terms of milligrams of androsterone, the normal male excretes about 7 mg. daily when tested by the capon method.^{16a} Androsterone is apparently a metabolic derivative of the true testicular hormone, testosterone,³⁶ but about one third of the excreted androsterone is probably derived from the adrenal cortex.^{36a,b,c} Dehydroandrosterone amounts to about 5 per cent of the ketosteroids, but this is increased to as much as 15 per cent of the total in normal males between the ages of 20 and 27.^{36d}

The excretion of androgens in children is from 0.3 to 2 milliequivalents of androsterone. Likewise, the andro-

gen excretion in males past the age of 40 is diminished.^{36b} In castrates and eunuchs there is a distinct decrease in androgen excretion to about one third of normal.³⁷ Studies of borderline hypogonadism have not been intensive as regards androgen excretion. The differential diagnosis of psychic and organic impotence by means of androgen assays would be valuable to clinicians. Disorders of sperm formation are not likely to result in significant changes in androgen excretion inasmuch as androgenic substances are more concerned with the function of the accessory sex organs.

Males also excrete estrogenic substances in small amounts equivalent to about 10 micrograms of estrone daily. This amount is decreased considerably in eunuchs and castrates, indicating that a good part of the estrogen is a metabolic derivative of testosterone. This contention is supported by the demonstration that injections of testosterone raise the yield of urinary estrogens in both castrate and normal men.^{36a,c}

A theory has been evolved that a relative excess of estrogens is responsible for the production of prostatic adenoma. Dingemans and Laqueur³⁸ were unable to confirm this theory, although they found significant variations from the normal steroid excretion in males with prostatic adenoma. The estrogen-androgen ratios of such patients average 1:3, compared with an average ratio of 2:1 in normal males of the same age.

In understanding testicular disorders gonadotropin assays are often helpful. Certain neoplasms of the testes elaborate gonadotropic substance. Seminoma, a tumor of the germinative epithelium, secretes little or no gonadotropin. Teratoma, with or without chorionic tissue, elaborates varying amounts, from several hundred rat units daily to as much as a million rat units. This gonadotropin is similar, if not identical, with the chorionic gonadotropin of pregnancy. The course of a patient who has had such a tumor removed may be followed by examinations of the urine for gonadotropin at intervals following the operation.

ADRENAL CORTEX

The adrenal cortex elaborates numbers of steroids. These have widely varying properties, although many of them are similar in their behavior. For instance, some of the steroids may have androgenic, estrogenic or even progestational activity. Others have marked effects on salt and water metabolism, capillary permeability, and carbohydrate, fat and protein metabolism. The maintenance of life and health in adrenalectomized animals is probably due to a combination of the various activities of the adrenal steroids, although there are a number of these compounds which can alone maintain the life of adrenalectomized animals for considerable time. There are, however, certain metabolic weaknesses in these surviving animals. For instance, desoxycorticosterone may maintain the life of adrenalectomized animals or patients with Addison's disease, but it cannot adequately alleviate hypoglycemic reactions which may occur, since it has little or no role in regulating carbohydrate metabolism.

At the present time, assays for the urinary 17-ketosteroids are of some value in detecting types of adrenal

34. Buxton, C. L., and Westphal, U.: Recovery of Pregnandiol in Urine of Men Treated with Progesterone, *Proc. Soc. Exper. Biol. & Med.* **41**: 284 (May) 1939. Hamblen, E. C.; Cuyler, W. K., and Hirst, D. V.: Urinary Excretion of Pregnandiol Complex by Males: II. Following Intramuscular Administration of Progesterone, *Endocrinology* **27**: 172 (Aug.) 1940.

35. Engel, L. L.; Thorn, G. W., and Lewis, R. H.: Urinary Excretion of Steroid Compounds: Normal Male Subjects, *J. Biol. Chem.* **137**: 205 (Jan.) 1941. Hirschmann, H.: Steroids of Urine of Ovariectomized Women, *ibid.* **136**: 483 (Nov.) 1940.

36. (a) Dorfman, R. I.: Fate of Testosterone in the Human, *Proc. Soc. Exper. Biol. & Med.* **45**: 739 (Nov.) 1940. (b) Kochakian, C. D.: Excretion of Male Hormones, *Endocrinology* **21**: 60 (Jan.) 1937. (c) Callow, N. H.; Callow, R. K., and Emmens, C. W.: The Effect of the Administration of Testosterone Propionate on the Urinary Excretion of Compounds Allied to the Steroid Hormones, *J. Endocrinol.* **1**: 99 (June) 1939. (d) Baumann, E. J., and Metzger, N.: Colorimetric Estimation and Fractionation of Urinary Androgens, *Endocrinology* **27**: 664 (Oct.)

37. Callow, N. H., and Callow, R. K.: Excretion of Androgens by Eunuchs: The Isolation of 17-Ketosteroids from the Urine, *Biochem. J.* **34**: 276 (March) 1940. Kenyon and others.^{38a}

38. Dingemans, E., and Laqueur, E.: The Content of Male and Female Hormone in the Urine of Patients with Prostatic Hypertrophy, *J. Urol.* **44**: 530 (Oct.) 1940; abstracted, *J. Clin. Endocrinol.* **1**: 89 (Jan.) 1941.

dysfunction.³⁹ Thus, while the alpha ketosteroid, androsterone, is chiefly a product of the testes, the beta ketosteroids, such as dehydroisoandrosterone, are exclusively products of the adrenal cortex. Under certain conditions beta ketosteroids are greatly increased in quantity—for instance, in patients with hyperplasia, adenoma or carcinoma of the adrenal cortex. Cushing's syndrome due to pituitary basophilism may be clinically quite similar to the adrenogenital syndrome resulting from neoplasm or hyperplasia of the adrenal cortex. An analysis of the androgen excretion is of distinct value in differentiating between the pituitary and the adrenal type of Cushing's syndrome. Talbot and associates have concluded:

The beta neutral ketosteroids arise solely from substances produced by the adrenal cortex. It follows as a corollary that the rate of excretion of beta ketosteroids may be an index of at least one aspect of adrenocortical activity. The assay of the alpha, beta and total neutral ketosteroids gives specific information which may be useful in differentiating adrenocortical hyperplasia, Cushing's syndrome without adrenal tumor, and adrenocortical carcinoma.

Other ketosteroids have been found to be excreted in large amounts in adrenal virilism.⁴⁰ An increase in steroids which maintain life was demonstrated in the blood stream of a patient with hyperfunction of the adrenal cortex (Cushing's syndrome).⁴¹ In some cases of adrenal carcinoma large amounts of estrogens may also be found excreted in the urine.⁴² In precocious puberty unrelated to the adrenal cortex there is little change in the excretion of beta ketosteroids.

Weil and Browne⁴³ have been able to detect significant amounts of life-maintaining steroids in the urine of normal persons. These substances were found in increased amounts under certain conditions, chiefly when the subjects had been placed under stress, as in infections, operations and exposure to cold.

PREGNANCY

The excretion of the various sex hormones in pregnant women differs considerably from that in normal women. It is acknowledged that the placenta has a prominent role in the elaboration of many of these hormones. In addition to increases in amounts of substances which are present in normal persons, an entirely different one appears: chorionic gonadotropin or the anterior pituitary-like hormone. This is the substance which is responsible for the widely used pregnancy tests involving gonadal stimulation; it is not found in the absence of chorionic tissue. Within a few days after the first missed period, chorionic gonadotropin appears in the body fluids and may be detected by injecting the urine into rabbits or rats. The concentration of this substance increases rapidly, and from twenty to fifty days after the last missed period tremendous quantities may be found; as much as several hundred thousand rat units

have been demonstrated in a liter of pregnancy urine for a short time around this period.⁴⁴ This occurrence has been described as an explosion, since it appears and disappears rapidly. After this peak, the daily gonadotropin excreted remains at a fairly constant level, from 3,000 to 10,000 rat units, until the termination of pregnancy, after which it disappears from the body within four or five days. The most reliable and practical of pregnancy tests is the well known Friedman test, which has withstood the test of time and is considered one of the most useful biologic methods available to the clinician. Chorionic gonadotropin is elaborated, in addition, by the chorionic tissue of the hydatid mole and by chorioepithelioma. Quantitative assays may be useful in the detection of such tissue, the quantitative Aschheim-Zondek method being used. Several years ago it was considered that high values for chorionic gonadotropin were diagnostic of these growths. It has been conclusively demonstrated, however, that normal or even low values may occasionally be found when the uterus contains either of these growths. Although high titers of chorionic gonadotropin after the third month of pregnancy are excellent evidence for the diagnosis of these conditions, nevertheless, the finding of normal values or even low ones does not rule out the occurrence of a hydatid mole or a chorionic tumor. The clinical history and physical examination should be carefully considered under these circumstances. Tests for chorionic gonadotropin are also of value in cases in which such tumors have been removed, since metastases are capable of elaborating the gonadotropin, and they may be traced by testing the urine at intervals.

The excretion of estrogens in pregnancy is somewhat complicated, since there are at least three estrogenic substances found in the urine, each of which occurs both free and combined with glycuronic acid. The placenta is responsible for the elaboration of most of the estrogens of pregnancy. The total estrogen content of pregnancy urine rises gradually from the first missed menses to term, at which time the excretion amounts to as high as 100,000 rat units daily. Patients differ greatly, and the daily excretion of any given one fluctuates considerably also. The Smiths⁴⁵ and their associates have studied, both biologically and gravimetrically, the excretion of estrogens through partitioning the total estrogen into its three components, estrone, estriol and estradiol. Their work is in agreement with that of Cohen, Marrian and Watson⁴⁶ that about 90 per cent of the estrogenic activity in the late months is due to estriol. The Smiths and their associates found that at about two months of pregnancy the ratio between estrone and estriol was 1:2 but that at nine months it was about 1:15. Estradiol is excreted at a fairly uniform rate throughout pregnancy, averaging about 0.13 mg. daily. The amounts of estrone and estriol constantly increase until term. There is, however, a sudden rise of estradiol in the urine at term, with a disappearance of estrone from the urine. At this time estriol is also present in lesser amounts. According to these investigators, the changes in estrogen pattern result from a reduction in the progesterone output at term. The lack of this substance is claimed to be responsible for the depressed conversion of estrone to

39. Crooke, A. C., and Callow, R. K.: The Differential Diagnosis of Forms of Basophilism (Cushing's Syndrome), Particularly by Estimation of Urinary Androgens, *Quart. J. Med.* **8**: 233 (July) 1939. Levy-Simpson, S.; de Fremery, P., and Macbeth, A.: The Presence of an Excess of "Male" (Comb-Growth and Prostate-Stimulating) Hormone in Virilism and Pseudo-Hermaphroditism, *Endocrinology* **20**: 363 (May) 1936. Talbot and others.^{39a}

40. Butler, G. C., and Marrian, G. F.: Chemical Studies on the Adreno-Genital Syndrome: I. The Isolation of 17-one, 3 (B)-Hydroxyetioallocholan-17-one Triol from the Urine of a Woman with Chem. **124**: 237 (June) 1938; correction, *Nature*, London **142**: 400 (Aug. 27) 1938.

41. Anderson, E.; Haymaker, W., and Joseph, M.: Hormone and Electrodye Studies of Patients with Hyperadrenocortical Syndrome (Cushing's Syndrome), *Endocrinology* **23**: 398 (Oct.) 1938.

42. Frank, R. T.: A Suggested Test for Functional Cortical Adrenal Tumor, *Proc. Soc. Exper. Biol. & Med.* **31**: 1204 (June) 1934.

43. Weil, P., and Browne, J. S. L.: The Excretion of Cortin After Surgical Operation, *Science* **90**: 445 (Nov. 10) 1939.

44. Evans, H. M.; Kohls, C. L., and Wonder, D. H.: The Gonadotropic Hormone in the Blood and Urine of Early Pregnancy: Normal Occurrence of Transient Extremely High Levels, *J. A. M. A.* **108**: 287 (Jan. 23) 1937.

45. Smith, G. V., and Smith, O. W.: Estrogen and Progestin Metabolism in Pregnant Women, with Especial Reference to Pre-Eclampsic Toxemia and the Effect of Hormone Administration, *Am. J. Obst. & Gynec.* **39**: 405 (March) 1940.

46. Cohen, S. L.; Marrian, G. F., and Watson, M.: Excretion of Oestrin During Pregnancy, *Lancet* **1**: 674 (March 23) 1935.

estriol and the increased destruction of estrogens. A theory of parturition has been advanced by Cohen, Marrian and Watson, who demonstrated that large amounts of combined estrogens are spontaneously altered to the free or active state immediately preceding parturition, thus accounting for the sudden contractility of the uterus.

Progesterone is elaborated during the first three months by the corpus luteum of the ovary. After the third month the placenta takes over the function of secreting progesterone. Assays for pregnandiol indicate that at about the hundredth day there may be a drop in excretion due to a lag in elaboration of progesterone by the placenta.⁴⁷ It is significant that habitual abortion is most common at this time, and the theory has been advanced that the decrease in progesterone content of the blood renders the uterus sensitive and contractile. Pregnanliol excretion in normal pregnancy is not uniform but varies from day to day and among individuals. At the fifth week of pregnancy about 8 mg. (as sodium pregnandiol glycuronide) is excreted daily and at term this rises to an average of about 80 mg. Removal of the corpus luteum in pregnancy in 2 cases did not result in a decrease in the pregnandiol excreted.^{48a,b} Ovariectomy in one pregnant patient resulted in a significant drop in pregnandiol excretion although gestation remained undisturbed.^{48c}

The toxemias of pregnancy have been investigated through hormone excretion chiefly by the Smiths and their associates. This group has demonstrated that during a toxemia or even preceding the development of such a state there is a definite disturbance of the ratio between estrogens and gonadotropin.⁴⁶ Their evidence indicates that the content of chorionic gonadotropin in the blood serum and the urine is increased, while the blood and urine concentration of estrogens is significantly lowered. They have maintained also that this imbalance may be counteracted by the administration of large doses of estrogens and progesterone. More recently they have claimed that the lowered pregnandiol excretion during toxemias is an important factor in the altered estrogen metabolism in these states. Partitioning of the estrogens during toxemias revealed that the estrone fraction dropped to very low values or disappeared entirely, the estriol fraction decreased considerably, but the estradiol fraction increased. Such changes were explained by the failure of estrone conversion to estriol caused by lack of progesterone, which also allowed an increase in destruction of the estrogens. It has already been pointed out that these investigators demonstrated similar changes in estrogen concentrations at parturition. Taylor and Scadron⁴⁹ obtained lowering of estrogen and elevation of gonadotropin levels in only a few of their patients with toxemias. They believed that these occasional changes may have been due to hepatic or renal disturbances rather than to any defect in hormone metabolism. Other evidence, which does not support the theories of the Smiths and their associates on estrogen metabolism of normal and abnor-

mal pregnancy, was contributed by Hain.⁵⁰ This worker recovered large amounts of combined estrogen before or even during parturition in normal women. Furthermore, large amounts of pregnandiol were also found preceding or during normal labor in some women as well as in an eclamptic woman. Hain was unable to subscribe to the theory of deconjugation of estrogens as the cause of labor. Nevertheless, Weil⁵¹ has observed lowered pregnandiol excretion in toxemia and Taylor and Scadron⁴⁹ have reported a similar observation in a small series of cases. The excretion of androgens in pregnancy was found to be normal by several workers.^{28b}

MISCELLANEOUS OBSERVATIONS

There are numerous reports on hormone excretion in a variety of conditions. Most of these show little uniformity in the results obtained. For example, Geschickter and associates⁵² have claimed that in chronic cystic mastitis there is an increased estrogen content of the mammary tissue. They have also indicated recently that pregnandiol determinations revealed a deficiency of progesterone in this condition.⁵³ Taylor⁵⁴ was unable to find any increase in urinary estrogens in women with this disturbance. In regard to acne vulgaris, which has long been suspected to be the result of some endocrine disturbance, numerous assays have been reported. It has recently been demonstrated that in patients with this disorder there is decreased excretion of estrogens and normal excretion of androgens.⁵⁵ This relative predominance of androgens has been considered the etiologic factor for the changes in the skin. This work has not been confirmed as yet. There have been several reports of an altered estrogen-androgen ratio in homosexuality. None of this evidence has been adequately confirmed. It is of considerable interest that in males with cirrhosis of the liver there is increased excretion of free estrogens due to failure of the liver to conjugate them with glycuronic acid. In those patients with cirrhosis who have testicular atrophy there is little androgen excretion.⁵⁶ This decrease in the androgen-estrogen ratio is believed to be responsible for the hyperplasia of the breast tissue in such patients. Assays in cases of hemophilia revealed no abnormality of estrogen excretion, apropos the theory advanced several years ago that a deficiency of estrogen accounted for this disturbance in males.

Physicians will be disappointed if they expect simple or casual hormone assays to furnish them with significant information except in a few isolated cases. Intensive and carefully controlled investigations are essential in contributing to knowledge of normal or abnormal endocrine physiology. The rapid strides made in the past few years are encouraging, and it is anticipated that definite practical aid will be available to the clinician with the accumulation of reliable data on the assays of hormones and related compounds.

47. Browne, J. S. L.; Henry, J. S., and Venning, E. H.: The Significance of Endocrine Assays in Threatened and Habitual Abortion, *Am. J. Obst. & Gynec.* 38: 927 (Dec.) 1939.

48. (a) Browne, J. S. L.; Henry, J. S., and Venning, E. H.: The Corpus Luteum Hormone in Pregnancy, *J. Clin. Investigation* 16: 678 (July) 1937. (b) Jones, H. W., and Weil, P. G.: The Corpus Luteum Hormone in Early Pregnancy, *J. A. M. A.* 111: 519 (Aug. 6) 1938. (c) Seegar, G. E., and Delfs, E.: Pregnanliol Excretion Following Bilateral Oophorectomy in Early Pregnancy, *ibid.* 115: 1267 (Oct. 12) 1940.

49. Taylor, H. C., Jr., and Scadron, E. N.: Hormone Factors in the Toxemias of Pregnancy, with Special Reference to Quantitative Abnormalities of Prolan and Estrogens in the Blood and Urine, *Am. J. Obst. & Gynec.* 27: 963 (June) 1939.

50. Hain, A. M.: The Excretion of Oestrogen and Pregnanliol by Pregnant and Parturient Women: Normal and Toxaemic Cases, *J. Endocrinol.* 2: 104 (May) 1940.

51. Weil, P. G.: The Excretion of Pregnanliol in the Toxemias of Pregnancy, *Science* 87: 72 (Jan. 21) 1938.

52. Geschickter, C. F.; Lewis, D., and Hartman, C. G.: Tumors of the Breast Related to the Oestrin Hormone, *Am. J. Cancer* 21: 628 (Aug.) 1934.

53. Bucher, N. L. R., and Geschickter, C. F.: Corpus Luteum Studies: Pregnanliol and Estrogen Output in Urine of Patients with Chronic Cystic Mastitis, *J. Clin. Endocrinol.* 1: 58 (Jan.) 1941.

54. Taylor, H. C., Jr.: The Relation of Chronic Mastitis to Certain Hormones of the Ovary and Pituitary and to Coincident Gynecological Lesions: I. Theoretical Considerations and Histological Studies, *Surg. Gynec. & Obst.* 62: 129 (Feb.) 1936.

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56. Glass, S. J.; Edmondson, H. A., and Soll, S. N.: Sex Hormone Changes Associated with Liver Disease, *Endocrinology* 27: 749 (Nov.) 1940.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
THEODORE G. KLUMPP, M.D., Secretary.

LIPOSOL NOT ACCEPTABLE FOR N. N. R.

Liposol is the trademarked name of a preparation marketed by J. C. Shay, Inc., Philadelphia. The firm has not presented the product to the Council, but, because of occasional inquiries from physicians, an investigation of the preparation has been necessary.

The firm distributes a brochure entitled "Colloidal Lipoid Therapy" in which Liposol is described as ". . . a preparation of lanolin in a colloidal state, known as sol, is dispersed in distilled water, is not protected by any stabilizing agent, has a fatty particle of uniform diameter of 1 micron or less, and contains 5 per cent glucose to make it isotonic with the blood. It is stable under extremes of temperature, from 0 centigrade to 100 degrees or more. It contains less than 0.5 per cent ethyl alcohol and has a pH of slightly less than 7.6, and is not adjusted by any chemical or buffer. The amount of fat is 0.45 grams per 100 cc. The fat particles are electronegative and exhibit energetic Brownian motion. Each cc. contains 102,000,000,000 fat particles."

The preparation is marketed in bottles of 250 cc. each. The label describes Liposol as follows: "This preparation is protein-free, non-toxic and adjusted to the pH of the blood stream. It contains 5 per cent glucose to render it isotonic and less than 0.5 per cent ethyl alcohol. It cannot produce embolism as colloidal fat is a natural component of the blood serum (by delivery through the thoracic duct)." On the label it is further stated: "This colloidal fatty sol acts by adsorption, its tremendous surface development apparently 'fixing' a circulating toxin elaborated by bacteria because of the well known affinity of lipid substances for toxic radicals. It is in no sense a specific for any organism, is not in the nature of an antibody but is a finely divided cholesterol ester sol of the three fatty acids—palmitic, oleic and stearic acids." The label lists no specific contraindications and directs that Liposol should be kept at room temperature and used intravenously, with the usual gravity infusion setup, after heating content of bottle to body temperature and straining through sterile gauze. Warning to administer the sol very slowly for the first five minutes is included. The dose recommended is "Usually 250 cc. (1 bottle)," but "500 cc. or more have frequently been given in severe cases." "If toxic symptoms and temperature persist after forty-eight hours the dose should be repeated." No specific indications are stated on the label.

Although the brochure contains the statement that "It is not our intention to convey the impression that Liposol will work miracles," the following headings are listed for the discussion of indications for Liposol therapy: "Pneumonia," "Puerperal Sepsis (to include endometritis, parametritis and the accompanying peritonitis)," "Infectious Arthritis and Rheumatic Fever, Gonorrheal Arthritis," "Streptococcal Blood Infections and Meningitis, Bacteraemia," "Sepsis and Positive Culture Bacteraemia," "Osteomyelitis and Other Bony Affections," "Peritonitis and Upper Abdominal Infections," "Urosepsis and Allied Conditions," "Skin Diseases or Manifestations," "Neuritis," "Mental and Psychiatric Conditions" and "Eye Disease and Ophthalmological Conditions."

The brochure is completed with a section devoted to equipment and administration with instructions for making chylomicron studies of the serum, a series of temperature charts to show the effect of Liposol in several types of cases and a bibliography. Examination of the latter reveals no less than seventy-seven references to superscript numbers in the text of the brochure. These are arranged in such a way that several may be grouped under the same number, so that the superscript total comprises only thirty-six. In this way a single number in the text annotates from one to nine references, presumed to support the statements used. As a matter of fact, occasionally only one such

reference has any bearing on the material presented, the others serving to "pad" the bibliography in a confusing manner. The basis of the firm's claims for Liposol rests almost entirely on the paper of Boericke and Young,¹ who record certain test tube and biologic experiments in support of their hypothesis that "fat may have a 'detoxicating' effect on circulating toxins." These authors state that they "are convinced that the colloid has no effects directly on the bacteria themselves, acting simply as a therapeutic 'sponge' to absorb toxins and thereby give the patient a chance to capitalize on his natural resistance or the other treatment instituted."

A careful examination of the Boericke and Young paper fails to reveal any data which could be said to establish the therapeutic usefulness of the lanolin preparation employed for the treatment of toxic conditions due to varying infective states as claimed by the firm. Under these circumstances there appears to be ample justification for the adoption of a skeptical attitude toward any claims of established therapeutic usefulness which might be advanced on behalf of Liposol.

The A. M. A. Chemical Laboratory made the following report to the Council on April 7, 1939:

"One original 250 cc. bottle of Liposol (J. C. Shay, Inc., Philadelphia, Pa.) which had been purchased from Sargent's Drug Store on March 6, 1939, was submitted to the A. M. A. Chemical Laboratory for examination at the request of the Council on Pharmacy and Chemistry.

"The content of the bottle was a white, milky liquid, practically odorless and possessing a sweet taste. Qualitative examination indicated that the product was a colloidal suspension of a fat in water; and that ethanol, dextrose and lanolin were present. Quantitative examination yielded the results given in the accompanying table, from which it may be calculated that the product consisted of a colloidal suspension, containing approximately 0.52 Gm. per hundred cubic centimeters of lanolin as the dispersed phase and 5.98 Gm. of U. S. P. dextrose and 0.48 cc. of ethanol with water in each hundred cubic centimeters as the dispersing phase. The product was stable on centrifugation, showed distinct brownian motion under the ultramicroscope and was stable over the temperature range of 0 C. to 100 C. The fat particles were immediately coagulated by many electrolytes and dyes, such as methylene blue, which were adsorbed. The pH of the product was lower, and the dextrose content slightly higher than that claimed."

Results of Quantitative Examination

	Found	Claimed
Specific gravity (25 C.)	1.020	....
pH	5.1	Approx. 7.6
Total solids (Gm. per 100 cc.)	6.66	....
Ash (Gm. per 100 cc.)	0.0	0.0
Ethanol (cc. per 100 cc.)	0.48	Approx. 0.5
Lanolin (anhydrous, Gm. per 100 cc.)	0.52	0.45
Dextrose (U. S. P. Gm. per 100 cc.)	5.98	5.0
Adsorptive power (as mg. methylene blue per 100 cc.)	3.3	....

It would appear that the firm has selected reports which bear, in one way or another, on the lipoids, involving relations of lipoids to metabolic dysfunctions, immunologic reactions, nutritional disturbances and pharmacologic phenomena. The data quoted from these various reports have no actual bearing on the use of Liposol in therapy but serve merely to give a scientific air to the advertising material, possibly with the hope of leading physicians to believe that there is a definite basis for such therapy. Actually there is little evidence which can be accepted as scientific which bears out the claims of the firm that Liposol is of value for any therapeutic purpose. While the firm admits that Liposol does not work miracles, the claims that it is of value in pneumonia of all sorts, all kinds of arthritic conditions, puerperal sepsis, osteomyelitis, urosepsis, mental and psychiatric conditions, eye diseases and a variety of other conditions is indicative that Liposol therapy is apparently considered by the firm to be a "cure-all." Claims for Liposol therapy are exaggerated and unjustified, and the recommendation for the use of this substance for therapeutic purposes is without adequate foundation.

The Council declared Liposol (J. C. Shay, Inc.) unacceptable for inclusion in New and Nonofficial Remedies because the advertising claims for the product are grossly exaggerated and its use is without adequate support of scientific evidence.

1. Boericke, G. W., and Young, W. W.: An Artificial Fat Colloid and Its Value in Certain Toxic States, *Hahnemannian Monthly* 81: 26 (Jan.) 1936 (Hahnemann Medical College and Hospital, Philadelphia).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JULY 12, 1941

THE INSULIN MONOPOLY

In 1923 the governors of the University of Toronto acquired patents to control the manufacture and sale of extract of the pancreas containing the active principle insulin. Subsequently, four manufacturers were licensed to make and market this important drug in the United States. At least one other concern entered into negotiations for the right to place the article on the market, but for reasons which are not known it remained out of the business. In 1939 one of the four original licensees discontinued manufacturing preparations of insulin, allegedly because the business in this item was no longer profitable under the existing conditions.

In March 1941 the Department of Justice charged the three manufacturers of insulin in the United States with price fixing in violation of the Sherman Act. This action was terminated by pleas of *nolo contendere*, and large fines were levied against the concerns and their principal officers. Judging by the text of a proposed license agreement, the price at which insulin was to be sold was subject to the terms of the agreement between the governors of the University of Toronto and the manufacturer. Since the three manufacturers were the ones doing business in the United States, the action of the government was of necessity directed against them. But the question may be fairly asked whether the action of the government does not cast its principal reflection elsewhere.

The insulin committee of the University of Toronto deserves great credit for the task it has performed in controlling the quality and potency of the insulin placed on the market. The price of insulin has steadily declined. In 1925 a 10 cc., 40 unit vial of insulin sold for \$2.40. In 1931 it was \$2. At present it sells for 57 cents. This reduction has been accomplished despite a 60 per cent increase in the cost of glands since 1925.

The suit which involved three of the leading pharmaceutical manufacturers in the United States was perhaps most poorly chosen by the Department of Justice, one reason being that the product concerned is manufactured under a patent held by an educational group in a univer-

sity outside the United States. Another reason is, of course, the fact that the patent terminates in a short time. A third is that the price of this product, as has already been mentioned, has been brought down to almost the minimum at which such a product can be sold. Finally, the costs of defending such suits are tremendous. Had the firms attempted to defend themselves, and had they attempted to bring out in court the facts here mentioned, they would have had to increase considerably the price of insulin in the United States; this would have worked a hardship on almost a million persons with diabetes.

Of the patents held by educational groups, that administered by the University of Toronto is the most notable example. The result of the recently terminated action has wide implications as far as educational institutions holding patents are concerned. This is particularly true where the institution attempts to control the use of the patent by licensing agreements. Some schools, including the University of Toronto, have used patents as a source of revenue, the royalties thus accruing being used for various purposes. Recently one of our large universities published an article pointing out the profit making possibilities of patents and toward this end urged its members to get busy and discover something worth patenting. To this spirit in academic research may be attributed the increasing tendency toward secrecy and isolation, a trend which can be viewed only with alarm. The authority of the University of Toronto over its licensees is so complete that they may dictate even the names of new products related to insulin. The monopoly of a patent carries with it grave public responsibilities. In the scramble for patent rights, it is no profit to a university to gain the whole world and lose its own soul.

DISEASES OF ITALIAN EAST AFRICA

In view of the present necessity for large scale troop movements in Eritrea, Abyssinia and Italian Somaliland, the recent review of prevalent diseases in these areas by Manson-Bahr¹ is timely. Malaria, he says, takes pride of place as chief impediment to European colonization, and in Abyssinia the incidence of various forms of malaria is exceptionally high in spite of the mountainous nature of the country. In Eritrea malaria is everywhere present. In Somaliland this disease is absent from the arid deserts but is widely spread in the cultivated and irrigated districts. Both the visceral type of leishmaniasis—kala-azar—and the cutaneous form—oriental sore—occur throughout Eritrea and Abyssinia. Human trypanosomiasis has not yet been discovered in Abyssinia, but various species of tsetse fly are found in the south. In southern Somaliland one species of that fly (*Glossina pallidipes*) is the vector of the animal trypanosomiasis in that area. Relapsing fever is widely

1. Manson-Bahr, Philip: The Prevalent Diseases of Italian East Africa, *Lancet* 1: 609 (May 10) 1941.

distributed throughout all these regions. The range of yellow fever in Africa extends much farther in a northern and eastern direction than was formerly supposed. According to all authorities, Manson-Bahr states, typhus is widespread throughout the high Abyssinian plateau and occurs in endemic and epidemic forms. It occurs too on a minor scale in Eritrea. Dengue and sandfly fevers are endemic in Somaliland and probably throughout the whole area. Plague has been reported on several occasions in Somaliland. Accurate information on the dysenteries is not available, but bacillary dysentery is probably common and amebiasis widespread. Among the other diseases which apparently are widespread in these regions are lobar pneumonia, epidemic meningitis, rabies and the helminthic diseases. Venereal diseases are a pest everywhere in the region, especially in Abyssinia, and gonorrhea is almost universal:

That soft sore and lymphogranuloma inguinale (climatic bubo) are almost as common may be inferred from the romantic reports of Castellani (1939) to the *Office Internationale d'Hygiène Publique*. In these, gullible plutodemocrats are invited to believe that to Dessye, which is a military center, hundreds of aristocratic Abyssinian girls flocked to become enrolled in a "corps of charmers" and begged the victorious Italian troops to obey the Duce's commands of the strictest sexual prophylaxis; as a result, we are told, no case of venereal disease has ever been contracted by the clientele of the *Maison de Tolérance Blanche*, instituted by the authorities on the spot!

Among minor horrors listed by Manson-Bahr are several varieties of poisonous snakes and the chigger, which, he says, constitutes a first class minor pest.

Public opinion regarding the nosology of Abyssinia [Manson-Bahr says] may have been greatly influenced by the official medical reports on the Italian conquest of that unfortunate country; these presented a rosy picture, whereas, on the evidence of the Italian observers quoted in this paper, none of the territories under consideration can honestly be described as health resorts. Some reference is obviously necessary to the account which Castellani has given to the world in his papers and lectures on the hygienic measures and hospital organizations of the Italian expeditionary forces during the Ethiopian War of 1935-1936. Even a cursory examination demonstrates that the figures are to a large extent fallacious. It is necessary to emphasize this point, since this report has been widely cited as the outstanding example of modern military hygienic achievement (see Scott 1939). It is only necessary to refer to a few of the obvious anomalies. The number of white troops engaged was over 500,000 and, during the seven months of war, deaths from disease (including those from accidents such as drowning) numbered 599, which gives a figure for the annual death rate of 2 per thousand; this puts the death rate of the Italian army at less than 2.9, the lowest annual figure ever recorded for the age groups 20-30 in the Registrar-General's Report for England and Wales under peace conditions and lower than the lowest to be recorded for the Italian army in Italy. Nor need we regard seriously the remarks on the low incidence of malaria among the Italian troops during this campaign; this was ascribed to quinine prophylaxis in one of the most malarious countries in the world, in direct contradiction to the testimony of the Italian medical officers quoted in this paper. In a country teeming with tapeworms only two were noted in the Italian forces. It can, therefore, be surmised that in this case political propaganda has overridden statistical accuracy.

Thus the true picture of disease conditions in the Italian African empire is beginning to emerge; the whole story must await further study.

DIETARY PROTEIN AND ITS RELATION TO HEALTH AND DISEASE

Protein is man's chief source of nitrogen. The quality and quantity of dietary protein influence growth, maintenance and repair as well as reproduction and lactation. Furthermore, like carbohydrate and fat, protein is an important source of energy. In view of the indispensable part which it plays in vital processes, a recent review¹ of the relationship between this nutritive substance and health and disease merits comment.

Man can adapt himself to varying amounts of protein in the diet; the material may be largely animal or vegetable in origin. Apparently harmful defects do not result from either extreme, provided the process of amino acid supplementation is effective and the total amount ingested is adequate. The nutritive value of proteins from different sources, to be sure, varies considerably, owing particularly to differences in their amino acid composition, some proteins containing all of the so-called indispensable amino acids, others lacking one or more. Although the biologic value of proteins of animal origin is generally superior to that of plant proteins, different plant proteins can supplement one another. When a variety of these is freely selected, an absolute need for the inclusion of proteins of animal origin in the diet is apparently absent. Nevertheless, as far as economic and other circumstances permit, human subjects generally prefer a diet in which more than half of the protein is from animal sources. The attractive flavor and ease of assimilation of animal protein, as well as its association with other dietary essentials, are important factors in this choice.

Protein takes part in reparative processes in the body; much nitrogen may be lost during fever or following traumatic injury, and during convalescence adequate dietary protein is required for the restoration of wasted tissues. For this purpose, according to Cuthbertson,¹ animal protein seems more desirable than vegetable protein. A high protein diet has been reported to eliminate the latent period in the healing of wounds in dogs;² similarly, protein fed to protein depleted dogs may protect them from liver injury due to chloroform anesthesia.³

The possible deleterious effect on the kidney of diets rich in protein has been investigated. Numerous studies have been made on animals which were fed diets high in this dietary factor, but the results obtained by various research workers are conflicting; in some instances chronic nephritis was observed, in others only an apparently compensatory hypertrophy of the kidneys

1. Cuthbertson, D. P.: Quality and Quantity of Protein in Relation to Human Health and Disease, *Nutrition Abstr. & Rev.* **10**:1 (July) 1940.

2. Clark, A. H.: The Effect of Diet on the Healing of Wounds, *Bull. Johns Hopkins Hosp.* **30**:117 (May) 1919.

3. Miller, L. L., and Whipple, G. H.: Chloroform Liver Injury Increases as Protein Stores Decrease, *Am. J. M. Sc.* **199**:204 (Feb.) 1940. Moise, T. S., and Smith, A. H.: Diet and Tissue Growth, *J. Exper. Med.* **40**:13 (July) 1924.

without obvious lesions. The existing confusion has led to the conclusion of McCollum, Orent-Keiles and Day⁴ that the "relation of dietary protein level to kidney lesions remains a mystery." Observations on Greenland Eskimos have shown that their high protein diet does not predispose to renal or vascular disease.⁵ Stefansson and Anderson, who lived for a protracted period on an exclusive meat diet of high protein content, completed the experiment without rise in blood pressure or signs of renal impairment.⁶

When animals are fed diets low in protein over a time, the so-called nutritional edema develops, presumably because there is a fall in the serum protein level and in the oncotic pressure under these circumstances. The condition is alleviated when the protein content of the diets is increased. As seen in man, however, nutritional edema is often associated with other dietary deficiencies. While the primary etiologic factor may be subsistence for a long time on a diet insufficient to preserve nitrogen equilibrium, the evidence is still not conclusive. Bloomfield,⁷ for instance, has questioned the obligatory relationship between a deficiency of protein in the diet and hypoproteinemia and concludes that a combination of factors, including a defective protein ration, is operative.

The question of relationship between dietary protein and resistance to disease is intriguing. Typical of the observations bearing on this point is that of Clements,⁸ who found that natives of the New Guinea region who eat a well balanced diet rich in proteins and vitamins are relatively immune to tropical ulcers, while other natives who subsist on a less well balanced diet in which the ratio of carbohydrate to protein is high and the supply of vitamins is poor are susceptible. A complete absence of tropical ulcers was noted in fishing villages where the diet contained 60 to 70 per cent of protein.

The importance of the quantity and quality of dietary protein for the satisfaction of the nitrogen requirement of the organism and the maintenance of good health has been repeatedly demonstrated. In many cases in which interrelationships have been observed, however, protein was not the only variable factor in the diet. These investigations have indicated, nevertheless, numerous and often unsuspected ways in which this key constituent of foodstuffs may be of service to the body.

Current Comment

PHYSICAL DISQUALIFICATION UNDER THE SELECTIVE SERVICE LAW

Early this year Britten and Perrott¹ published data on the physical defects of men drafted during 1917-1918 which showed that about one third of those examined were considered unfit for general military service under the standards then prevailing. More recently these same investigators have reported that some 43 per cent of those examined under the present Selective Service Law are being classified in the same general category.² This percentage includes those rejected as unfit for any military service (class IV-F) as well as those found fit for only limited military service (class I-B). Actually, about 28 per cent are being placed in the former group. With regard to the prevalence of various disqualifying conditions, deficient or defective teeth alone render over 8 per cent of the men examined unfit for general military service. Eye defects and diseases are responsible for about 5 per cent of those placed in class IV-F and class I-B. Comparable percentages for other frequently found defects are 3.69 for diseases of the cardiovascular system, 3.17 for musculoskeletal diseases, 2.95 for ear, nose and throat diseases and 2.02 for hernia. Other important factors, which were, however, less frequently observed, are diseases of the respiratory system, venereal diseases, foot diseases, overweight and underweight, and diseases of the genitourinary system. Although the current rate of disqualification under the Selective Service Act is greater than that observed during most of the World War period, one is not justified in concluding that the health of the American youth of today is inferior to that of young men of a quarter of a century ago. As pointed out by Britten and Perrott, improved diagnostic techniques, changes in physical standards and a dissimilar situation with regard to immediate need for soldiers tend to vitiate comparisons. An official release from the War Department points out that the examiners of 1917, who were trying to build an army as fast as possible, train them quickly and ship them to France, were more lenient in passing on men who seemed physically able for duty required. Examiners today are not pressed, and directions to boards incline toward stressing the necessity of securing men who are physically able to withstand the stress of a year's intensive training. Few of those who comment on the draft realize that physical requirements were changed seven times during the World War. Thousands of men were accepted in 1917 who would have been rejected by present day examiners. Furthermore, the War Department says that the advancement in medical science gives the present day examiners a decided advantage over medical men of twenty years ago. For this reason an unknown number of men are rejected today because

4. McCollum, E. V.; Orent-Keiles, Elsa, and Day, H. G.: *The Newer Knowledge of Nutrition*, New York, Macmillan Company, 1939.

5. Thomas, W. A.: *Health of a Carnivorous Race*, J. A. M. A. **88**: 1559 (May 14) 1927.

6. Lieb, C. W.: *The Effects on Human Beings of a Twelve Months Exclusive Meat Diet*, J. A. M. A. **93**: 20 (July 6) 1929.

7. Bloomfield, A. L.: *The Effect of Restriction of Protein Intake on the Serum Protein Concentration of the Rat*, J. Exper. Med. **57**: 705 (May) 1933; *Effect of Carrot Feeding on Serum Protein Concentration of Rat*, *ibid.* **59**: 687 (June) 1934.

8. Clements, F. W.: *The Relation of Diet to Tropical Ulcer*, M. J. Australia **1**: 520 (April 21) 1934; *Diet in Relation to Tropical Ulcers*, *abstr.* J. A. M. A. **106**: 139 (Jan. 11) 1936.

1. Britten, R. H., and Perrott, G. S.: *Summary of Physical Findings on Men Drafted in the World War*, Pub. Health Rep. **56**: 41 (Jan. 10) 1941. *Physical Defects of Drafted Men*, editorial, J. A. M. A. **116**: 1175 (April 19) 1941.

2. Britten, R. H., and Perrott, G. S.: *Causes of Physical Disqualification Under the Selective Service Law: Early Indications*, Pub. Health Rep. **56**: 1017 (May 9) 1941.

of tuberculosis, latent syphilis, obscure mental derangements and other disorders who would have been passed in 1917. Fortunately, many defects which are found by present day technics are remediable. Moreover, special attention is being given to programs of rehabilitation³ as well as prehabilitation⁴ of registrants.

ANTHRAX FROM SHAVING BRUSHES

During the last World War, many infections with anthrax were traced to shaving brushes. The infections acquired from this source induce an especially high fatality rate, owing presumably to the highly vascular area affected, according to Smyth¹ from 50 to 66 per cent. A recent article on the subject by Stone² confirms the opinion that such infections produce the highest percentages of deaths, although shaving brushes cause fewer than 8 per cent of the industrial cases of anthrax. Most of the infections seem to have resulted from "sterilized" brushes imported from Japan. One new brush marked "Imperial, Sterilized Japan, 332" was found by Stone to harbor anthrax organisms identified by direct culture and guinea pig inoculations. Nine additional used brushes of this same brand were obtained as a result of radio and press requests. Anthrax organisms were not obtained from the brush portions, but the ends of the hairs embedded in the wood handles were examined and anthrax was found in one of the nine. Thus care in the purchase of shaving brushes and skepticism of the Japanese "sterilized" label is strongly indicated.

THE PREVALENCE OF SYPHILIS

Knowledge of the prevalence of syphilis in various groups of the population in the United States has been inadequate. In an attempt to remedy this situation, Di Mario and her colleagues¹ have recently reported an attempt to determine more accurately the incidence of this disease. This incidence can be estimated best by the sampling method, and in view of the rather large samples which are now available for at least some groups it can be interpreted with reasonable accuracy by statistical methods. Their sample, as a whole, consisted of nearly 1,900,000 cases in which blood tests had been performed for the years 1935 to 1940. Of this number over 61,000 were reported to be positive, yielding a prevalence rate of 3.24 per cent. This figure varies, however, depending on the age group, color, sex, occupation and other factors. After corrections are made for these factors, Di Mario and her colleagues

conclude that the average prevalence rate for syphilis for the United States as a whole was 3 per cent for the years 1935 to 1940. This rate, however, is a general rate, based on a nationwide sample and not applicable to any one region, occupation, age or color group. The wide variation is underlined by Vonderlehr,² who states that "Unpublished analyses of serologic and clinical examinations of 1,070,000 selectees and volunteers as of April 15, 1941 indicate a total of approximately 48,500 cases of syphilis. For white selectees and volunteers for whom reports were submitted, the rate was 18.5 per thousand; for Negroes, 241.2 per thousand." Clearly the incidence of syphilis in Negroes is so much higher than in comparable white groups that over-all gross figures are almost meaningless. The greatest effort should be directed toward those groups which are most heavily infected. It is certainly unwise to draw uncritical conclusions from the gross rates for the country as a whole.

MONKEYS FOR AMERICAN LABORATORIES

According to the Bureau of Biological Survey, permits for the importation of rhesus monkeys into the United States in recent years have varied between 12,000 and 16,000 animals per annum. In a communication by Carpenter¹ on this subject, published in *Science*, two questions were considered: 1. Will this drain on the rhesus monkey population seriously limit or deplete the supply in India? 2. Since various embargoes have been imposed during recent years, is there a possibility of serious limitation which would curtail important scientific research? The first question can be readily answered, Carpenter says. There seems to be ample evidence that a deficiency in the number of monkeys in India is not even a remote possibility; indeed, in many regions the monkeys are so numerous as to be viewed as pests. The second question is more difficult. The Hindus and Buddhists consider these animals to be quasi sacred and resent their capture and exportation. The conditions of exportation and transportation are admittedly deplorable. After a review of the subject, Carpenter recommends further study of the problem, the licensing of trappers and shippers, preshipping testing of the animals for tuberculosis and a real effort toward the improvement of shipping conditions. It is also possible, he believes, that the New World platyrrhine monkeys may be substituted for rhesus monkeys for some experiments. Furthermore, it has been demonstrated feasible to develop breeding colonies for a limited number of rhesus monkeys in the United States or nearby in the Western Hemisphere. In view of the extremely important contribution which rhesus monkeys have made and are making toward the solution of many medical problems, the questions which Carpenter outlines deserve careful study in order that there may be no hampering of important scientific research.

3. Public Health in the National Defense Program: Summary of Proceedings, Conference of State and Territorial Health Officers with the United States Public Health Service, Washington, D. C., Sept. 16-17, 1940, Pub. Health Rep. 55: 1760 (Sept. 27) 1940.

4. The Prehabilitation of Registrants: A Plan for Rendering Registrants Fit for Examination and Service, J. A. M. A. 116: 1777 (April 19) 1941. Prehabilitation of Registrants, this issue, p. 116.

1. Smyth, H. F.: A Twenty Year Survey of Anthrax in the United States: Sixth Report of the Committee on Anthrax, Industrial Hygiene Section, American Public Health Association, Pittsburgh, Oct. 18, 1939.

2. Stone, R. V.: Anthrax in Shaving Brushes, J. Lab. & Clin. Med. 26: 1032 (March) 1941.

1. Di Mario, Marie; Edwards, Mary S., and Clarke, C. W.: How Many People Have Syphilis? A Brief Report on the Prevalence of Syphilis in the United States, J. Social Hyg., June 1941.

2. Vonderlehr, R. A.: U. S. Public Health Service Bulletin, Special VD Education, Circular 3, June 12, 1941, Health Defense.

1. Carpenter, C. R.: Rhesus Monkeys (*Macaca Mulatta*) For American Laboratories, *Science* 92: 284 (Sept. 27) 1940.

MEDICAL PREPAREDNESS

In this section of *The Journal* each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

PREHABILITATION OF REGISTRANTS

Following is an outline which is being circulated by the Selective Service Administration to all persons registered under the Selective Service Act:

Making yourself fit for service is probably a very simple procedure. At most it involves only three steps: 1. Learn the minimum requirements of the Selective Service Regulations. 2. Consult your family doctor or dentist, one or both, if you discover or suspect that you fall short of what is demanded of you. 3. Follow their advice if arrangements can be made on a basis mutually satisfactory; if not, let them direct you to the nearest clinic, hospital or social service agency best suited to your particular needs.

Here is the relative proportion of defects that have been the principal cause of rejections at the local Selective Service boards and at the Army induction stations:

Defect	Percentage of Total Rejections	
	Selective Service	Army
Teeth	18.55	19.32
Eyes	10.56	13.25
Cardiovascular system	10.06	6.18
Musculoskeletal defects	8.36	4.90
Mental and nervous	6.24	10.48
Ears	4.45	9.52
Hernia	4.20	5.28
Lungs	3.86	5.00
Venereal	3.49	4.44
Feet	3.07	3.64

Many of these rejections could have been avoided by wise forethought and intelligent action. By rendering yourself fit for service you are preparing yourself to meet the requirements of the examinations. The requirements are listed below, together with the advice considered desirable.

TEETH

Requirements.—An adequate number of serviceable teeth—six biting and six chewing teeth, three pairs of each that are opposite each other when chewing. Fillings, crowns, dummies and fixed and removable bridges may make a tooth acceptable.

Advice.—See your dentist, have cavities filled and proper replacements made; have teeth cleaned and clear up oral infection.

HEART AND CIRCULATION

Requirements.—The heart is considered acceptable if normal in size, position, shape, rate, rhythm and sound, and if free from murmurs and trills which indicate disease of the valves. The blood vessels are considered normal if the walls are not thickened and if the pulse is of moderate rate, constant rhythm and the blood pressure is not increased above normal.

Advice.—See your doctor if (1) moderate exercise causes undue shortness of breath, palpitation, racing, pounding, or distress about the heart; (2) your heart skips beats or is irregular; (3) your pulse is too fast, above 90, or too slow, below 60; (4) if you have had rheumatism or syphilis; (5) you have varicose veins or evidences of disease or pain in the blood vessels of the arms or legs associated with changes in color. Have your blood pressure taken two or three times so as to exclude at examination functional factors due to excitement or exertion.

MUSCULOSKELETAL DEFECTS

Requirements.—The body should be of normal size and shape and well proportioned. The arms and legs should be equal in length, posture should be erect, the gait unrestricted and the

stride normal. There should be nothing abnormal about the head, trunk or extremities.

Advice.—See your doctor (1) about defects of the framework, deformities of the bones or joints, faulty posture or gait, drooping shoulders, curvature of the spine, slight shortening of an extremity, old fractures, prominent shoulder blades, deformity of feet—bunions or hammer toes; (2) if you limp or sway in walking or suffer from pains or aches in your joints, muscles or nervous system; (3) if you have suffered in the past from serious diseases of the bones, such as tuberculosis, discharging sinuses of other infections.

EYES

Requirements.—The vision should be moderately good in both eyes or capable of being rendered so by glasses. Test cards are read at 20 feet. The army requires each registrant to see at 20 feet what the normal person sees at 100 feet without glasses, if by use of glasses he can see what the normal person sees at 40 feet. Mild degrees of inflammation, squint, color blindness and small operative scars do not necessarily disqualify. You can test yourself with some accuracy by determining if you can read in a good light block letters $1\frac{3}{4}$ inches in size at a distance of 20 feet without glasses, and letters of about $\frac{3}{4}$ inches in size with glasses.

Advice.—See your doctor if (1) you have poor vision, (2) you are near or far sighted, (3) you need or wear glasses, (4) you have a squint, unsteady or pop eyes, (5) you have inflammation or deformity of the eyes, lids or drop lids, or (6) if your eyes tire unduly, water too much or burn, and suffer from headaches after excessive reading or movies. A pair of glasses and treatment of minor ailments now may save you a world of trouble at a later date and may prevent rejection by the army.

GENITOURINARY ORGANS AND VENEREAL DISEASE

Requirements.—The kidneys, bladder and genital organs must be free of serious disease and the urine free of albumin and sugar. Acute gonorrhea and early syphilis are so readily cured that they will not constitute a basis for permanent rejection.

Advice.—See your doctor if you have any form of venereal disease, suffer from bed wetting, have any swelling of the testes or scrotum or any other genital trouble.

MENTAL AND NERVOUS SYSTEM

Requirements.—Registrants are acceptable who appear to have normal understanding, whose speech can be understood, who have no definite signs of organic disease of the brain, spinal cord or body nerves, who are bright mentally and are capable of reading and writing equivalent to the requirements of fourth grade grammar school.

Advice.—See your doctor if (1) you have any speech defects or muscular tremors, (2) you have personality problems, abnormal fears or behavior defects, (3) if you have had mental disease of any kind in the past, or (4) you have any bad habits or definite vice.

EARS

Requirements.—Hearing should be good in both ears, capable of detecting low conversational voice sounds at 20 feet in a quiet room. Hearing is considered acceptable if such sounds can be heard at 10 feet.

Advice.—See your doctor if hearing is poor in either ear, if the ear discharges pus or if the ear drum has been broken.

NOSE AND THROAT

Requirements.—The breathing space must be adequate, the voice normal and the nasal passages clear.

Advice.—See your doctor if (1) your tonsils are excessively large, chronically diseased, or if you are subject to frequent attacks of tonsillitis; (2) you have difficulty breathing through your nose; (3) you have adenoids, enlarged glands in the neck, mild cleft or perforated palate; or if (4) you lose your voice or suffer from hoarseness or from hay fever. Simple procedures may effect a cure and materially benefit health. Frequently, curtailment in smoking will bring about marked improvement in the respiratory system.

HERNIA

Requirements.—Ruptured individuals are not acceptable. Ruptures occur most frequently in the lower part of the abdomen and in the groin. Sometimes these ruptures occur at the navel and in other areas in the abdomen, but especially in the scars of abdominal wounds. Ruptures express themselves by localized bulging at these areas, which are greater on coughing.

Advice.—See your doctor and get his advice. He may refer you to a surgeon. Most ruptures can be operated on with great success and with little danger. Sometimes it is difficult to say whether or not a bulging is really a hernia, but in this matter take the surgeon's decision and act accordingly.

FEET

Requirements.—What is needed is feet that are functionally satisfactory, since they bear the weight of the body on long marches and particularly marches accompanied by the carrying of considerable weight in the form of equipment.

Advice.—See your doctor if your feet give you trouble in walking. Let him determine whether or not corrective measures are needed. Flat feet are exceedingly common, but many people with flat feet have no difficulty in using them satisfac-

torily. Negroes almost always have flat feet yet in the majority of instances have no difficulty in getting about.

LUNGS AND CHEST

Requirements.—The lungs, respiratory system and chest must be approximately normal. The chest circumference must be at least 28¾ inches and the respiratory expansion at least 2½ inches. Acute bronchitis, small, old, healed tuberculous lesions and healed fractures do not disqualify. One must be entirely free from coughs, expectoration or signs of asthma. The chest wall should be strong, well formed with good expansion.

Advice.—See your doctor if you suffer from chronic coughs and infection, spit blood, are too thin or have afternoon fever or night sweats. Coughs and colds may be readily cleared up. Roentgenograms of the chest are often of the greatest help to the doctor in assisting him to come to a definite conclusion as to the seriousness of the trouble.

HEIGHT AND WEIGHT

Requirements.—Examining physicians will use discretion and judgment in accepting registrants with slight variations in ratio of height and weight as indicated in the table, provided it is the opinion of the examining physician that the variation is correctable with proper food and physical training; but no registrant may be accepted whose weight is less than 105 pounds and whose height is less than 60 inches or greater than 78 inches.

Advice.—See your doctor if too thin or too fat; such conditions are readily correctable by appropriate attention to diet, exercise and rest. The majority of registrants can bring themselves within the acceptable weight limits without much difficulty.

These few simple statements may help you to render yourself fit for examination and service. But whether or not you are accepted, the advice given—if followed—will help to restore you to a normal and markedly improved state of health.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY WAR DEPARTMENT

The following additional medical reserve corps officers have been ordered to extended active duty by the War Department, Washington, D. C.:

AGATE, George Henry, 1st Lieut., Ann Arbor, Mich.
BRADDOCK, William Hallock, Lieut. Col., Wood, Milwaukee County, Wis.
BURKE, James Otey, 1st Lieut., Richmond, Va.
DRAKE, James Richard, 1st Lieut., Los Angeles.
GIDOLL, Sidney Henry, Major, San Francisco.
GLICKLICH, Earl Alfred, 1st Lieut., Cincinnati.
HUGHES, Frederick John, Jr., 1st Lieut., Plainfield, N. J.
JOHNSON, Benjamin Hardy, Jr., 1st Lieut., Sayre, Pa.
KOSCHNITZKE, Herman Kaiser, 1st Lieut., LaCrosse, Wis.

SIXTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Sixth Corps Area, which comprises the states of Wisconsin, Illinois and Michigan:

ALM, Bernhard T., Captain, Dearborn, Mich., 30th Division, Fort Jackson, S. C.
BAUSCH, Richard G., 1st Lieut., Detroit, Reception Center, Scott Field, Ill.
BOMZE, Edward J., 1st Lieut., Chicago, 94th Engineers, 5th Division, Fort Custer, Mich.
BRONSON, William W., 1st Lieut., Detroit, Randolph Field, Texas.
BYRN, Robert W., 1st Lieut., Ann Arbor, Mich., Reception Center, Camp Grant, Ill.
CARRON, Harold, 1st Lieut., Detroit, Scott Field, Ill.
CARSTENSEN, Vincent H., 1st Lieut., Detroit, Ellington Field, Houston, Texas.
COOK, James A., 1st Lieut., Lincoln Park, Mich., Scott Field, Ill.
CORMACK, William F., 1st Lieut., Wausau, Wis., Savanna Ordnance Depot, Proving Ground, Ill.
DEVIESE, Marion S., 1st Lieut., Ann Arbor, Mich., Ellington Field, Houston, Texas.
EHLICH, Norman J., 1st Lieut., Chicago, Station Complement, Camp Croft, S. C.
FELDKAMP, Lee Edgar, 1st Lieut., Ypsilanti, Mich., Armored Force Troop Unit, Fort Benning, Ga.

LYTTON, William Bryan, Jr., 1st Lieut., Webster Groves, Mo.
MENDELSON, Harvey Joseph, 1st Lieut., Cleveland.
OVITT, David Wilkie, 1st Lieut., Milwaukee.
ROMAN, Paul Wolfe, 1st Lieut., Glenn Dale, Md.
SAMPLINER, Robert Bruce, 1st Lieut., New York.
SCHELL, Robert Eugene, 1st Lieut., Nashville, Tenn.
STIRLING, Earl Hopkins, 1st Lieut., Washington, D. C.
TENNER, Robert Johnson, 1st Lieut., Rochester, Minn.
VALVERDE, Mario Francis, 1st Lieut., Scranton, Pa.
WARING, Thomas Lowry, Captain, Iowa City.
WOLFF, Bruce Newcomer, 1st Lieut., Gettysburg, Pa.
ZIMMERMANN, Karl, 1st Lieut., Pittsburgh.

Orders Revoked

KIMBROUGH, Robert Cooke, 1st Lieut., Madisonville, Tenn.

FELDMAN, Paul P., 1st Lieut., Mount Clemens, Mich., 30th Division, Fort Jackson, S. C.
GERBER, Harold X., 1st Lieut., Chicago, Reception Center, Camp Grant, Ill.
GIDDINGS, Ralph R., 1st Lieut., Bloomington, Mich., Station Hospital, Fort Custer, Mich.
GRUBMAN, Marvin, 1st Lieut., Chicago, 5th Division, Fort Custer, Mich.
GUNDERSON, R. H., 1st Lieut., Milwaukee, 5th Station Hospital, Camp Stewart, Ga.
HALEVY, Arthur A., 1st Lieut., Chicago, 30th Division, Fort Jackson, S. C.
HAMMER, Raymond W., 1st Lieut., Detroit, Station Complement, Camp Davis, N. C.
HANELIN, Joseph, 1st Lieut., Detroit, Air Base, Tucson, Ariz.
HARREL, Donald G., 1st Lieut., Detroit, Station Complement, Fort Jackson, S. C.
HINN, George J., 1st Lieut., Highland Park, Ill., Air Base, Tucson, Ariz.
HOWELL, Roderic B., 1st Lieut., St. Louis, Selfridge Field, Mount Clemens, Mich.
KOLB, Harold J., 1st Lieut., Benson, Ill., Chanute Field, Rantoul, Ill.
KORANSKY, Abraham, 1st Lieut., Chicago, 30th Division, Fort Jackson, S. C.
KRUGER, Sam, 1st Lieut., Chicago, 1st Medical Squadron, Fort Bliss, Texas.
KURTZ, James F., 1st Lieut., Chicago, Station Hospital, Fort Sam Houston, Texas.

MEDICAL PREPAREDNESS

Jour. A. M. A.
JULY 12, 1941

LELAND, Solomon, 1st Lieut., Detroit, 30th Division, Fort Jackson, S. C.
LOEFF, Harold M., 1st Lieut., Chicago, Station Hospital, Fort Jackson, S. C.
MILCAREK, Leonard J., 1st Lieut., Chicago, Savanna Ordnance Depot, Proving Ground, Ill.
NASH, John V., 1st Lieut., Chicago, Station Hospital, Fort Custer, Mich.
REY, George E., 1st Lieut., Detroit, Reception Center, Scott Field, Ill.
RHEA, Keith, 1st Lieut., Clinton, Ill., Chanute Field, Rantoul, Ill.
ROSENBLUM, Earl, 1st Lieut., Chicago, Air Base, Tucson, Ariz.
SCHLESINGER, Henry, 1st Lieut., Detroit, Station Complement, Selfridge Field, Mich.
SCHUG, Richard H., 1st Lieut., Detroit, Station Complement, Selfridge Field, Mich.
SCHWARTZ, Saul F., 1st Lieut., Milwaukee, Corsicana, Texas.
SLIVE, Alexander, 1st Lieut., Chicago, Station Hospital, Fort Sam Houston, Texas.
SYMONS, Hyman, 1st Lieut., Detroit, Station Complement, Selfridge Field, Mich.
WALLACE, Warren S., 1st Lieut., Highland Park, Mich., Selfridge Field, Mount Clemens, Mich.
WANLESS, Loren E., 1st Lieut., Detroit, Air Base, Oklahoma City.
WEBBER, Max E., 1st Lieut., Chicago, Chanute Field, Rantoul, Ill.
WEISBERG, Raphael, 1st Lieut., Eloise, Mich., Station Complement, Selfridge Field, Mich.
WINEBRENNER, John D., 1st Lieut., Ann Arbor, Mich., Station Complement, Selfridge Field, Mich.
WINTON, George, 1st Lieut., Detroit, Station Complement, Camp Croft, S. C.

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Seventh Corps Area, which comprises the states of North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri, Arkansas and Wyoming:

SEVENTH CORPS AREA

BENA, James Harry, 1st Lieut., Pittsburg, Kan., 63d Infantry, Fort Leonard Wood, Mo.
BIRGE, Richard Fuller, Captain, Des Moines, Iowa, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.
BLANK, John Nicholas, 1st Lieut., Buhler, Kan., 63d Infantry, Fort Leonard Wood, Mo.
BONANNO, Louis John, 1st Lieut., Kansas City, Mo., 214th General Hospital, Camp J. T. Robinson, Ark.
BOOTS, Roger Hammond, 1st Lieut., St. Louis, Corps Area Service Command Station Hospital, Jefferson Barracks, Mo.
BOURNE, Melvin Goodwin, 1st Lieut., Algona, Iowa, Corps Area Service Command Station Hospital, Jefferson Barracks, Mo.
BYRNES, Clemm Willroth, 1st Lieut., Dulap, Iowa, Corps Area Service Command Station Hospital, Fort Leavenworth, Kan.
CONE, Luther II., 1st Lieut., Chanute, Kan., Corps Area Service Command Station Hospital, Fort Leavenworth, Kan.
COOPER, Wayne Keith, 1st Lieut., Fort Dodge, Iowa, Corps Area Service Command Station Hospital, Jefferson Barracks, Mo.
DAY, Robert Jerome, 1st Lieut., Omaha, Fort Omaha, Neb.
DEAKIN, Thomas William, 1st Lieut., Omaha, Fort Omaha, Neb.
EDWARDS, Thomas Jefferson, 1st Lieut., St. Paul, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.
ERICKSON, Clarence Wilber, 1st Lieut., Pittsburgh, Kan., Corps Area Service Command Station Hospital, Fort Crook, Neb.
FREIBERG, Milton, 1st Lieut., Iowa City, Corps Area Service Command Station Hospital, Jefferson Barracks, Mo.
GOLDBERG, Isadore Edward, 1st Lieut., Polo, Mo., 63d Infantry, Fort Leonard Wood, Mo.
HUBER, Erwin Theodore, Captain, St. Louis, Corps Area Service Command Replacement Center Infirmary, Jefferson Barracks, Mo.
KENOYER, William Ray, 1st Lieut., Hugoton, Kan., Corps Area Service Command Cavalry Replacement Center Infirmary, Fort Riley, Kan.

Orders Revoked

CARLSON, Elmer Henry, 1st Lieut., Muscatine, Iowa, 63d Infantry, Fort Leonard Wood, Mo.
MULLIGAN, Leo Virgil, 1st Lieut., St. Louis, Mo., Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.
SMITH, William Russell, 1st Lieut., Carthage, Mo., Corps Area Service Command Station Hospital, Fort Leavenworth, Kan.
WHITE, Charles Herbert, 1st Lieut., Kansas City, Mo., Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.

Officers Relieved from Further Active Duty

HANKS, Ralf, 1st Lieut., Fulton, Mo., Fort Leavenworth, Kan.
HARRIS, Donald Macrac, Captain, Lemars, Iowa, Fort Leonard Wood, Mo.
MYERS, Kermit Whitney, 1st Lieut., Sheldon, Iowa, Fort Leonard Wood, Mo.
OLSON, Grant Edmund, 1st Lieut., West Concord, Minn., 30th Field Artillery, Camp Roberts, Calif.

EIGHTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Eighth Corps Area, which comprises the states of Colorado, Arizona, New Mexico, Oklahoma and Texas:

BEEBE, Milton, 1st Lieut., Fort Sam Houston, Texas, 55th Medical Battalion, Fort Sam Houston, Texas.
BLAIR, Clifford Jennings, 1st Lieut., Stapp, Okla., 368th Infantry, Fort Huachuca, Ariz.
BOURLAND, John B., 1st Lieut., Philadelphia, Station Hospital, Basic Flying School, San Angelo, Texas.
BROWN, Alex, 1st Lieut., El Paso, Texas, Corps Area Service Command, Camp Wolters, Texas.
CAMPBELL, Robert P., 1st Lieut., San Antonio, Texas, Corps Area Service Command Station Hospital, Fort Sam Houston, Texas.
CARTER, James William, Jr., 1st Lieut., El Paso, Texas, 55th Medical Battalion, Fort Sam Houston, Texas.
COHEN, Frank, 1st Lieut., Dallas, Texas, Corps Area Service Command, Camp Wolters, Texas.
COOK, Edward Tiffin, Jr., 1st Lieut., Anadarko, Okla., 368th Infantry, Fort Huachuca, Ariz.
DIMMITT, Dean Priest, 1st Lieut., San Antonio, Texas, 52d Signal Battalion, Fort Sam Houston, Texas.
FEAMSTER, Felix C., 1st Lieut., Lexington, Va., Station Hospital, Fort Sam Houston, Texas.
HARTNETT, Dalton C., 1st Lieut., St. Louis, Corps Area Service Command, Camp Wallace, Texas.
McCLURE, Edwin Eugene, 1st Lieut., New York, Corps Area Service Command, Camp Wallace, Texas.
MARIL, William David, 1st Lieut., Oklahoma City, 368th Infantry, Fort Huachuca, Ariz.
MEDFORD, Ulen Gail, Jr., 1st Lieut., Lufkin, Texas, Station Hospital, Ellington Field, Texas.

PARTAIN, Jack Minyard, 1st Lieut., San Antonio, Texas, Corps Area Service Command, Camp Wallace, Texas.
SALTER, John Joseph, 1st Lieut., San Antonio, Texas, Camp Wallace, Texas.
STUART, Lawrence D., 1st Lieut., Temple, Texas, Corps Area Service Command, Camp Wolters, Texas.
URE, William Grant, 1st Lieut., Tucson, Ariz., Station Hospital, Fort Bliss, Texas.
WYATT, Malcolm II., 1st Lieut., Amarillo, Texas, 55th Medical Battalion, Fort Sam Houston, Texas.

Orders Revoked

ADAMS, Richard Martin, 1st Lieut., Tulsa, Okla.
ARNIM, Landon C., 1st Lieut., Corpus Christi, Texas.
ASHBY, John Edmund, Captain, Dallas, Texas.
ATKINS, Paul N., Jr., 1st Lieut., Muskogee, Okla.
BARZUNE, Benjamin, 1st Lieut., Eunice, N. M.
BICKLEY, Estill Truett, 1st Lieut., Corpus Christi, Texas.
BLOOM, B. H., 1st Lieut., San Antonio.
BOX, Otto H., Jr., 1st Lieut., Grandfield, Okla.
BRADFORD, SIDNEY W., 1st Lieut., Tyler, Texas.
CARRITHERS, CLEM MILBURN, 1st Lieut., Bruni, Texas.
CHAFFIN, Lyle A., 1st Lieut., Oklahoma City.
CONDELL, Herschel Frank, Jr., 1st Lieut., Safford, Ariz.
COPE, SOLOMON FRANKLIN, Captain, Corpus Christi, Texas.
CROCKER, Ed. Sewell, 1st Lieut., Houston, Texas.
DASHIELL, Albert M., 1st Lieut., Austin, Texas.
FOX, F. T., 1st Lieut., Lawton, Okla.
GIPSON, Carrie D., 1st Lieut., Three Rivers, Texas.
GROSSMAN, Bernard E., 1st Lieut., Denver.
HAMME, Ralph Eugene, 1st Lieut., Edinburg, Texas.
HARRIS, Gracchus, Jr., 1st Lieut., Navasota, Texas.
HELPER, Lewis Michael, 1st Lieut., San Antonio, Texas.
HENDERSON, Walter Tillou, 1st Lieut., Dallas, Texas.
HODGES, Tom Wiley, 1st Lieut., Boston.

HUGHES, James Gilliam, 1st Lieut., Oklahoma City.
ISEN, Paul Jonathau, 1st Lieut., Waco, Texas.
JERMSTAD, Robert J., 1st Lieut., Fort Worth, Texas.
LEDBETTER, Wm. Henry, 1st Lieut., Wichita Falls, Texas.
LINDSEY, Ray Harvey, 1st Lieut., Pauls Valley, Okla.
LIPSCOMB, Cuvier P., 1st Lieut., Denison, Texas.
McCLURE, Harold M., 1st Lieut., Chickasha, Okla.
McKNIGHT, William Hodges, 1st Lieut., Fort Worth, Texas.
McMILLAN, George Sherrill, 1st Lieut., Hurley, N. M.
MATTs, Robt. Marshall, Captain, Yuma, Ariz.
MONROE, Myrick L., 1st Lieut., Jasper, Texas.
MURRY, Abel V., 1st Lieut., Picher, Okla.
PICKETT, Taylor Thomas, Captain, Garland, Texas.
ROBERTSON, David Lyle, 1st Lieut., Wichita Falls, Texas.

NINTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Ninth Corps Area, which comprises the states of Washington, Montana, Oregon, Nevada, Utah, California and Idaho:

AUBIN, Francis W., 1st Lieut., Havre, Mont., 7th Division, Fort Ord, Calif.
BELL, Hugh W., 1st Lieut., Bakersfield, Calif., Camp Murray, Wash.
BOLTON, Leslie T., Lieut. Col., Reno, Nev., Camp Roberts, Calif.
COLETTI, Anthony E., 1st Lieut., Clearfield, Utah, Camp San Luis Obispo, Calif.
COMPARETTE, Homer L., 1st Lieut., Hondo, Calif., March Field, Calif.
COULTER, James D., Captain, Portola, Calif., 7th Division, Fort Ord, Calif.
DAVIS, Donald D., 1st Lieut., Salt Lake City, March Field, Calif.
DeFRIES, William A., 1st Lieut., San Francisco, Hamilton Field, Calif.
DICKMANN, Richard C., 1st Lieut., Glendale, Calif., Hamilton Field, Calif.
DIXON, Edward F., Captain, Troy, Mont., Camp Roberts, Calif.
ELGIN, James C., 1st Lieut., Los Angeles, Camp Roberts, Calif.
FISHBON, Harris M., Captain, San Francisco, Fort Winfield Scott, Calif.
FREDRICKSON, Clyde H., Lieut. Col., Missoula, Mont., Camp Roberts, Calif.
GLASS, Bernard R., 1st Lieut., San Francisco, Calif., Fort Ord, Calif.
GOLDBERG, Percy H., 1st Lieut., Los Angeles, California-Aero Training Corporation, Oxnard, Calif.
GOLENTERNEK, Dan, 1st Lieut., Los Angeles, Camp Callan, Calif.
GRAHAM, John H., Captain, Billings, Mont., Fort Worden, Wash.
HARMON, Ellis D., Major, San Francisco, 4th Army, Presidio of San Francisco, Calif.
HEAVEY, John T., Captain, Gustine, Calif., March Field, Calif.
HENSTELL, Henry H., 1st Lieut., Los Angeles, Camp Roberts, Calif.
ILFELD, Frederic W., 1st Lieut., Los Angeles, Camp Callan, Calif.
IRVINE, Wendell C., 1st Lieut., Los Angeles, Camp Roberts, Calif.
JOHNSON, James B., 1st Lieut., Los Angeles, March Field, Calif.
JIEFFER, Albert L., 1st Lieut., Los Angeles, Camp Roberts, Calif.
KISTLER, Lewis M., 1st Lieut., Los Angeles, March Field, Calif.
KOHL, Gerald C., 1st Lieut., Summer, Wash., Fort Lewis, Wash.
McCARTHY, John J., 1st Lieut., Bakersfield, Calif., Air Corps Training Division, San Diego, Calif.
McGOWAN, Donald O., Captain, Los Angeles, Camp Roberts, Calif.

RYAN, William Emmett, Captain, Midland, Texas.
SIPTAK, John E., 1st Lieut., Caldwell, Texas.
SHAFER, Troy A., 1st Lieut., Harlingen, Texas.
SHARP, James Calvin, Captain, Corpus Christi, Texas.
SHERMAN, Joseph Harrison, 1st Lieut., Denver.
SHUPE, Reed Dalton, Captain, Phoenix, Ariz.
SLOAN, John James, 1st Lieut., Corpus Christi, Texas.
SMITH, Millard Ferdinand, Major, Raton, N. M.
SPARK, Milton, 1st Lieut., Waco, Texas.
STOUGH, Austin R., 1st Lieut., McAlester, Okla.
TOM, Henry Kee, Captain, Fort Arthur, Texas.
WHITE, Toler R., Major, Kingman, Ariz.
WILLIAMS, ONIE OWEN, Captain, Phoenix, Ariz.
ZARR, Luther Lynn, 1st Lieut., Houston, Texas.

McGREGOR, John F., 1st Lieut., Great Falls, Mont., 9th Army Corps, Fort Lewis, Wash.
MEYERS, Isadore, Captain, Boise, Ida., Vancouver Barracks, Wash.
MORAN, Frank A., 1st Lieut., Santa Monica, Calif., Hamilton Field, Calif.
OSIPOW, Samuel, Captain, San Francisco, Camp Roberts, Calif.
PIZER, Marvin I., 1st Lieut., Los Angeles, Camp Roberts, Calif.
RAY, Earl B., Captain, Bellflower, Calif., Camp San Luis Obispo, Calif.
SALE, George Goble, 1st Lieut., Missoula, Mont., Fort Lewis, Wash.
SAUNDERS, George C., 1st Lieut., Portland, Ore., Fort Lewis, Wash.
SCHWARTZMAN, Herman, Captain, Belden, Calif., Army Induction Station, Missoula, Mont.
SHUMAN, John W., Jr., 1st Lieut., Los Angeles, Hamilton Field, Calif.
STARK, James A., 1st Lieut., Alameda, Calif., Fort Lewis, Wash.
STILES, Frank E., Captain, San Francisco, Camp San Luis Obispo, Calif.
TRELSTAD, Bertram L., 1st Lieut., Redding, Calif., 203d General Hospital, Fort Lewis, Wash.
TUPPER, Walter R., 1st Lieut., Olive View, Calif., Camp San Luis Obispo, Calif.
WALTERS, John D., 1st Lieut., Los Angeles, March Field, Calif.
WALTERS, Richard D., 1st Lieut., Fullerton, Calif., Camp San Luis Obispo, Calif.
WEIZER, Ernest A., Captain, Oakdale, Calif., Camp Roberts, Calif.
WINN, Lawrence R., 1st Lieut., Huntington Park, Calif., Fort MacArthur, Calif.
WIRTH, Robert G., 1st Lieut., La Verne, Calif., Hamilton Field, Calif.
WOLFSON, Samuel A., 1st Lieut., West Los Angeles, Calif., Fort Ord, Calif.

Relieved from Duty

DITTO, Hugh H., 1st Lieut., reported ordered to Nacimientto, Camp Roberts, Calif.
HAFT, Stanley S., 1st Lieut., reported ordered to Nacimientto, Camp Roberts, Calif.
STARR, Harvey E., 1st Lieut., Los Angeles.

Orders Revoked

CORVINO, Leo F., 1st Lieut., Camp Roberts, Calif.
EASLEY, Clifford E., 1st Lieut., 1st Medical Regiment, Fort Ord, Calif.
MARSHALL, Joseph W., 1st Lieut., 3d Medical Battalion, Fort Lewis, Wash.
MARXER, Webster L., 1st Lieut., Camp Haan, Riverside, Calif.
ROSIN, Sidney, 1st Lieut.
ROW, Charles F., Jr., 1st Lieut., Camp Haan, Calif.

ORDERED TO FOREIGN DUTY

BAXTER, Clarence Pennell, Lieut. Col., M. R. C., San Diego, Calif., Camp Paraiso, Paraiso, Canal Zone.
COGAN, Leo Judas, Captain, M. R. C., Milwaukee, Wheeler Field, Schofield Barracks, Honolulu, Hawaii.
DAILEY, Jeremiah Aloysius, Captain, M. R. C., Station Hospital, Schofield Barracks, Honolulu, Hawaii.
FAIRCCHILD, Robert Durkee, 1st Lieut., M. R. C., Manila, P. I., Headquarters Philippine Department, Fort Santiago, Manila, P. I.
GLAUBMAN, William Aren, 1st Lieut., M. R. C., Brooklyn, Henry Barracks, Cayey, Puerto Rico.
HERMES, Richard Lawrence, 1st Lieut., M. R. C., Fairfield, Ohio, Puerto Rican Department, San Juan, Puerto Rico.
KAREL, Jack R., Captain, M. R. C., Tacoma, Wash., Station Hospital, Yakutat Landing Field, Yakutat, Alaska.

KELTZ, Charles, 1st Lieut., M. R. C., Los Angeles, 12th Medical Regiment, Fort William McKinley, P. I.
McQUEEN, Max Boyd, Captain, M. R. C., Lewiston, Ida., Station Hospital, Fort Richardson, Anchorage, Alaska.
MAUPIN, Clinton S., Captain, M. R. C., Waurika, Okla., Sternberg General Hospital, Manila, P. I.
POLLACK, David, 1st Lieut., M. R. C., San Juan, Puerto Rico, Ponce Air Base, Ponce, Puerto Rico.
SIMONSON, Sigwert Wallace, 1st Lieut., M. R. C., Cameron, Wis., Station Hospital, Schofield Barracks, Honolulu, Hawaii.
STANLEY, Thomas Z., 1st Lieut., M. R. C., Hudson, Pa., Department Training Center, Rio Hato, Albrook Field, Canal Zone.
SWAN, Joseph Jasper, 1st Lieut., M. R. C., Oklahoma City, Fort Richardson, Anchorage, Alaska.

NEW NAVY MEDICAL OFFICERS

The doctors of medicine listed below were issued appointments as Acting Assistant Surgeons in the Navy, with the rank of Lieutenant (junior grade), to rank from June 12:

ASHER, John Curtis, Atlanta, Ga.
BUENZ, George Charles, Philadelphia.
BUTLER, William E., Woodward, Okla.
CANEGA, Bruce L., Jr., Coronado, Calif.
CASEY, Dennis A., Jr., New Orleans.
CATTLE, Alfred B., McMinnville, Ore.
COLE, Gillon M., Dallas, Texas.
DeROSA, Vincent A., Long Branch, N. J.
DOCKENDORFF, William O., Everett, Wash.

GIBBONS, Harold M., Phoenix, Ariz.
HUSTON, J. Wilson, Bloomfield, Ky.
KIBLER, Robert S., Colorado Springs, Colo.
KOHLE, Daniel R., Monroe, Wis.
KUMMER, William M., Lancaster, Pa.
LENTZ, J. Raymond, Denver.
McNAMARA, Alexander P., Washington, D. C.
MERKEL, Richard L., Freeport, Ill.
REID, Robert W., Chicago.
ROGERS, Joseph, Boston.
RUSSELL, George W., Little Rock, Ark.
STRUBE, William E., Fort Worth, Texas.
SZYNAL, John S., Webster, Mass.
TUCKER, Wilson D., Morgantown, Pa.

DOCTORS FOR BRITAIN.

Eighteen American physicians will leave for England soon to supplement the work of British physicians. Fifty-six others will soon follow. The American Red Cross is acting as agent for the British Red Cross in offering the opportunity to American doctors to volunteer for this work.

Heretofore instructions to the American Red Cross provided that only American and Canadian trained doctors were acceptable for the project. No provision was made for Americans with British medical training. Experience showed that there is a considerable number of such physicians in this country. The American Red Cross now announces that it has been instructed to accept applications for British service from native-born American citizens under 45 who have completed their medical training in Great Britain and are otherwise eligible. British authorities will take the responsibility of judging the medical qualifications of each applicant.

MEDICAL STUDENTS GIVEN OPPORTUNITY TO OBTAIN RESERVE COMMISSIONS

Junior and senior medical students, instead of receiving blanket deferment from Selective Service, may be commissioned in the Medical Administrative Corps Reserve pending completion of their studies, the War Department announced, June 24. On finishing their medical courses such officers may then be appointed to the Medical Corps Reserve as medical officers. The new plan went into effect July 1. The students, as officers in the Medical Administrative Corps, will be a part of the War Department's Reserve Officer pool.

Applications, accompanied by report of physical examination, will be forwarded by the dean of the medical school to the commanding general of the corps area in which the school is located, together with a certified statement that the applicant has successfully completed the freshman and sophomore years of medical instruction and is an accredited matriculant in the junior or senior class in medicine at the institution. These officers will be discharged from the Reserve Corps and again be subject to the provisions of the Selective Service Act if they fail to complete their medical studies or if they fail to secure an appointment in the Medical Corps Reserve within one year of the completion of the prescribed four year course of medicine.

MEDICAL RESEARCH IN NATIONAL DEFENSE

The *Federal Register* for July 3 publishes two executive orders relative to medical research in national defense. The order of the Council of National Defense, approved Nov. 28, 1940, providing for the Health and Medical Committee to assume responsibility for medical research, is amended so that the duties, functions and activities of the Health and Medical Committee relating to medical research on problems affecting the national defense terminates as of such date on which the President shall designate an appropriate agency to assume these duties, functions and activities. In order that any unfinished business now pending under any contract involving such medical research heretofore entered into by the Health and Medical Committee or by the Federal Security Administrator in his capacity as Coordinator of Health, Welfare and Related Defense Activities, for and on behalf of the United States, may be duly carried out and completed, such contracts and all accompanying records of the said committee shall be placed in the custody and control of such office, division, committee or other agency in the Office for Emergency Management as may be designated by the President to perform these functions and duties heretofore performed by the Health and Medical Committee and the Federal Security Administrator.

The President also issued an order on June 28 revoking the order of the Council on National Defense establishing the National Defense Research Committee. It is understood that the Bush Committee is to be charged with research, including

medical research, that is to be reconstituted with medical membership and that additional funds will be provided to support necessary medical research for national defense.

OFFICERS AT STATION HOSPITAL, FORT DEVENS, MASS.

The following medical reserve officers are on duty at present at the Station Hospital, Fort Devens, Mass., which is under the command of Lieut. Col. Miner F. Felch, M. C., U. S. Army:

ALPERT, Max, 1st Lieut., Bridgeport, Conn.
ARONOFF, Solomon, 1st Lieut., Hoboken, N. J.
BRADLEY, Joseph James, 1st Lieut., Boston.
CACCIATORE, Thomas J., 1st Lieut., Brooklyn.
CHAMP, Anthony M., Major, Brockton, Mass.
CUMMINGS, Vincent P., 1st Lieut., North Adams, Mass.
DELGIUDICE, Amore, 1st Lieut., Waterbury, Vt.
DONAGHY, George, 1st Lieut., Boston.
EGAN, William Joseph, 1st Lieut., Boston.
FABER, Max, Captain, Chelsea, Mass.
GARDINER, Harry M., 1st Lieut., Ayer, Mass.
GRIFFIN, Julian P., 1st Lieut., Indian Orchard, Mass.
GRIGGS, Oscar B., Captain, Philadelphia.
HALL, Leonard J., 1st Lieut., Lowell, Mass.
HERRMANN, Albert E., Major, Waterbury, Conn.
JACOBS, Harry, 1st Lieut., Concord, Mass.
KAVANAH, James S., 1st Lieut., Methuen, Mass.
KELLY, Miles W., 1st Lieut., Avoca, N. Y.
LANOU, William, 1st Lieut., Pittsfield, Mass.
LEVINE, Samuel, Captain, Lynn, Mass.
MEDALIA, Leon S., Lieut. Col., Boston.
METCALF, John T., Captain, Brookline, N. H.
PHILLIPS, Robert T., Captain, Portland, Maine.
ROSENSTEIN, Samuel, 1st Lieut., Brooklyn.
SCHILDHAUS, Andrew, 1st Lieut., Shelburne, Vt.
SHAPIRO, Robert, 1st Lieut., Boston.
TASCARELLA, James W., 1st Lieut., Brooklyn.
VERSTANDIG, Charles C., 1st Lieut., Boston.
WILLSON, Allan T., 1st Lieut., Farmington, N. H.
YORK, Charles L., Jr., 1st Lieut., Plymouth, N. H.
ZELTZERMAN, Israel, 1st Lieut., Boston.
ZENTGRAF, Leo P., 1st Lieut., Belmont, Mass.

MOTION PICTURE FACILITIES AT HOSPITAL RECREATIONAL BUILDINGS

An offer of the American Red Cross to supply motion picture equipment and to operate the motion picture service in the Red Cross Recreational Buildings at Army hospitals has been accepted by the War Department. The equipment will be serviced by the Army Motion Picture Service. The twelve Red Cross Recreational Buildings which will receive the equipment are located at:

Aberdeen Proving Ground, Md.
Scott Field, Belleville, Ill.
Lowry Field, Denver.
Lovell General Hospital, Fort Devens, Mass.
Hoff General Hospital, Atlanta, Ga.
Stark General Hospital, Charleston, S. C.
Lawson General Hospital, Atlanta, Ga.
LaGarde General Hospital, New Orleans.
Billings General Hospital, Fort Benjamin Harrison, Ind.
Tilton General Hospital, Fort Dix, N. J.
Barnes General Hospital, Vancouver Barracks, Wash.
O'Reilly General Hospital, Springfield, Mo.

MEDICOMILITARY SYMPOSIUM AT BERKELEY

More than one hundred medical officers from northern California attended an all day medicomilitary symposium at the Berkeley Hospital, Berkeley, Calif., May 25. The program was prepared by the East Bay and West Bay Special Medical Military Schools, at which schools Major Harold R. Hennessy of the Medical Department is unit instructor, while Lieut. Col. Claude H. Church of the Medical Corps Reserve and Capt. L. D. Hertert of the Sanitary Corps Reserve acted as co-chairmen of the day. The symposium opened at 9 a. m. with registration. A barbecue luncheon was served. There were exhibits including one showing the organization of the U. S. Letterman General Hospital, San Francisco, and a scale model of the station hospital at Fort Ord, Calif. Major Milton H. Epstein of the Sanitary Reserve Corps presented a paper on "Nutrition

of the Soldier," Capt. George C. Shivers of the Medical Corps Reserve discussed problems of military surgery, S. B. Fontaine, D.D.S., "Traumatic Oral Surgery," Major J. M. Arburua of the Veterinary Reserve "Veterinary Problems of Mobilization" and Lieut. Col. John H. Schaefer "The Medical Reserve Officer's Responsibility in the Present Emergency."

TWO DAY PSYCHIATRIC SEMINAR

In cooperation with the Deputy Director of the United States Selective Service System, the Northern California Society of Neurology and Psychiatry held a psychiatric seminar at Stanford University Medical School, San Francisco, June 20-21. Drs. Walter Treadway, U. S. Public Health Service, and Harry S. Sullivan, consultant on psychiatry for the Selective Service System, and Lieut. Col. B. S. Thomas, U. S. Army Medical Corps, were responsible for the arrangements. The objects were to acquaint medical examiners of the Selective Service System with neuropsychiatric principles and working knowledge so that they may be more effective in weeding out the mentally unfit and to discuss the neuropsychiatric problems encountered in the Selective Service System. The chairmen of the various sessions were Dr. Arthur Bloomfield, professor of medicine at Stanford, Dr. Treadway, Lieutenant Colonel Thomas, Lieut. Col. John H. Schaefer and Dr. William J. Kerr, professor of medicine, University of California Medical School. Numerous others took part in the discussions and reading of the papers.

HEADQUARTERS OF SOUTH ATLANTIC RECREATIONAL AREAS

Headquarters for five Army recreational centers, located on the southern part of the nation's Atlantic coastline, will be established at Charleston, S. C., the War Department announced. The five camps, all under construction, are located at St. Augustine and Jacksonville Beach, Fla.; Savannah, Ga.; Charleston, S. C., and Wilmington, N. C. Initially the five camps will accommodate three thousand men. The St. Augustine center will accommodate one thousand men while the other four are scheduled for five hundred men each. The Civilian Conservation Corps is constructing the recreational centers, which are expected to be ready for use July 1.

Col. Dwight M. Green, Los Angeles, a physician who served overseas during the World War, will be in charge of the new centers. Colonel Green, who has been in command of the 364th Infantry in Los Angeles since 1922, took an active part in the organization of the Los Angeles Home Guards.

HOSPITAL TRAINS

In the approaching Army maneuvers in the South, new hospital trains that have been developed by the Surgeon General's Office will be used for the first time. A train will consist of a hospital unit car and additional Pullman or chair cars with hospital beds in place of seats. Each car with beds will have on duty three army nurses and three orderlies working on eight hour shifts. The hospital trains will transport sick or wounded soldiers to army hospitals. Col. James E. Bayliss, Fourth Corps Area Surgeon, with headquarters in Atlanta, will have general supervision of the hospital train units to be used in the forthcoming maneuvers.

ARMY NURSES

The number of Army nurses on active duty was expected to exceed five thousand by June 30, although the total number on duty a year ago was only nine hundred and forty-two. The total was expected to include about one thousand, eight hundred and seventy-five regular Army nurses, the present maximum number permitted, and three thousand, seven hundred and forty-four reserves. The nurses now serve one hundred and sixty stations, compared with only fifty-five on July 1, 1940. The procurement quota has been set at about eight thousand, four hundred for this year. Pay for Army nurses is \$70 a month plus full maintenance of mess, quarters, room and uniforms.

NEW AMBULANCE TO LOCATE DISABLED AIRPLANES

A new two way radio equipped ambulance has recently been put into operation at Kelly Field, Texas, the Air Corps Advanced Flying School. The ambulance was planned by Lieut. Col. Read B. Harding, senior flight surgeon at Station Hospital, Kelly Field, and Major John H. Bundy, director of flying, and will be used primarily to locate airplanes that have been forced down in wooded or isolated areas. The ambulance functions in cooperation with airplanes which locate the disabled plane and communicate with the ambulance, guiding it to the scene of the accident.

HOSPITAL FOR MITCHEL FIELD, NEW YORK

Construction of a one hundred and seventeen bed cantonment type hospital at a cost of \$290,000 at Mitchel Field, L. I., N. Y., has been approved by the War Department. Units to be built include one administration building, one officers' quarters, one nurses' quarters, one infirmary, four wards, one storeroom, one mess hall, two barracks, one recreation building, one heating plant, utilities, walks and other facilities.

RECEPTION CENTER AT CAMP PERRY

Construction of a one thousand man reception center at Camp Perry, Ohio, at a cost of \$862,700 has been approved by the War Department. The construction authorized for the project consists of twenty-two barracks, two mess halls, one processing building, one recreation building, two warehouses, one guard house, one ward, one administration building, two officers' quarters, one induction building, one post exchange, one fire station, one theater, one utilities shop, sewers, water system, roads and walks, electrical system and parking areas.

DISPENSARY IN WASHINGTON, D. C., TRANSFERRED

The Seventh General Dispensary, consisting of about forty officers and men, will be transferred from the Army War College, Washington, D. C., to Arlington Cantonment, Va., for a permanent change of station at the earliest practicable date.

MAYO FOUNDATION'S TRAINING UNIT SUSPENDED DURING EMERGENCY

The Medico-Military Inactive Status Training Unit of the Mayo Foundation scheduled for October 5-19 will be suspended during the present emergency. Notice through corps areas and naval districts will be published on resumption of the school.

CHICAGO INDUCTION STATION

The following medical reserve officers are on duty at the Chicago Induction Station:

APPEL, Ben Arthur, 1st Lieut.	KINZER, Richard E., 1st Lieut.
BUCZYNSKI, Charles C., Captain	KORANSKY, David S., 1st Lieut.
BURACK, Samuel, 1st Lieut.	MILLS, Morton J., Captain.
CASTRO, Cosimo, Captain.	POLLACK, Samuel, 1st Lieut.
DULIN, Theodore J., 1st Lieut.	ROBERSON, William V., 1st Lieut.
ELLWOOD, Walter W., Captain.	SALBERG, Arthur K., 1st Lieut.
ERENBERG, Leon M., Captain.	SHULRUFF, Harry I., 1st Lieut.
FARMER, Donald F., 1st Lieut.	SINAIKO, Russell P., 1st Lieut.
GOLDT, Henry B., 1st Lieut.	SMITH, Edward C., 1st Lieut.
GORDON, Hyman S., Captain.	TEBOREK, Roy F., 1st Lieut.
GREENBERG, Leo J., 1st Lieut.	URIST, Maurice D., 1st Lieut.
GROSSMAN, Sol C., 1st Lieut.	ZIMMERMAN, Lazar E., Captain
HELM, John E., 1st Lieut.	
JASINSKI, Thaddeus J., 1st Lieut.	

DETROIT INDUCTION STATION

The following medical reserve officers have been reported as on duty at the Detroit Induction Station:

BERLIEN, Ivan C., 1st Lieut.	STAMMELL, Benjamin B., 1st Lieut.
CAVELL, Roscoe W., Captain.	WACHS, Leonard V., 1st Lieut.
GOSS, Samuel B., 1st Lieut.	WHITELEY, Robert K., 1st Lieut.
MARKS, Ben, 1st Lieut.	
SPRUNK, Carl J., 1st Lieut.	

ORGANIZATION SECTION

GROUP PRACTICE

In 1932 the Bureau of Medical Economics made a study of group practice.¹ At that time 239 groups gave information as to their make-up. A second study of the same subject, just completed, gives an opportunity for comparison. It was found that about 100 of the groups that existed in 1932 had disappeared, but a much more thorough search for groups, supplemented by the assistance of the secretaries of county medical societies, secured returns from 335 groups.

Two qualifications were required for classification as groups: first, there had to be at least three physician members; and second, receipts from medical practice had to be pooled in some manner and then redistributed to members according to some previously arranged plan.

Within recent years a peculiar type of propaganda for group practice has arisen to confuse the situation. This propaganda assumes an imaginary "model type" of group which always has a well balanced, cooperative body of physicians composed of competent specialists who conduct research, education and the general practice of medicine. This propaganda assumes that all patients require extensive laboratory and specialist services and that the financial and scientific advantages are such that groups are destined to supplant the individual practice of medicine. It is further assumed that medical groups employ some contract arrangement for prepayment of the costs of medical services requiring solicitation and advertising and that control is shared with a lay membership.

The present study showed that only seventeen of the 335 groups had any system of prepayment practice. On the other hand, there were twenty-six groups with twelve or more members which had no system of prepayment but which were characterized by their high scientific standards, contributions to medical progress and extensive equipment. One of the standards by which it may be possible to measure group qualifications is the percentage of their members that received certificates from the recognized specialist accrediting organizations. Judged by these standards, the seventeen groups having prepayment plans have a smaller percentage of such accredited specialists than the average of all groups and a far less percentage than the twenty-six groups with twelve or more members. On the other hand, the prepayment groups have a much larger percentage of specialists who are self accredited than the average of all the groups and a still higher ratio compared with the twenty-six groups having twelve or more members who did not have prepayment plans.

A study of the history of groups indicates strongly that they have been influenced by the frontier phase of American history. Their greatest period of growth was in the five years from 1919 to 1923 inclusive. In spite of a high group mortality, there is a larger number of survivors of this five year period than of any succeeding equal period. This was the time when the scientific discoveries of Pasteur, Lister, Koch and the

Curies were firing the new generation of physicians with enthusiasm for laboratory methods. These young physicians went out to practice where laboratories and hospitals were rare or often nonexistent or poorly equipped and where specialization had scarcely begun. It was natural that they joined into groups where some of the members could give "special attention" to the phases of medicine in which they were most interested. Their pooled funds made possible some sort of a laboratory and often of a hospital. Today these conditions have largely disappeared except in a few localities. The physician practicing as an individual has access to laboratories and hospitals superior to the majority of those operated by groups. His choice of specialists is not confined to one of each type in a single organization.

A smaller percentage of groups investigated in 1939 and 1940 operated hospitals than in 1932. Many of the groups have found that the laboratories they are able to maintain are inadequate, and a large number of groups reported that they use outside laboratories or hospital facilities, such as are available to all private practitioners.

Is there any reason to believe that group medicine is growing at such a rate that it may in any reasonable time be expected to supplant private practice? Aside from the fact that the number of groups established annually seems to be decreasing is a further fact that the motives which cause physicians to join groups are not of any far reaching economic or personal type that would affect the great majority of physicians. Of 335 groups there were 109 with two or more physicians having the same family name. Family relations, therefore, would seem to have much to do with the formation of medical groups. Even in 1932 the majority of group members expressed the opinion that there was no financial advantage in group organization. That conclusion is affirmed and emphasized by the present study. It was difficult to obtain information concerning groups that had disappeared, but the most common complaint from those that did report was of financial difficulties. There were widespread reports of internal dissension within groups as one of the major causes of their high mortality.

The location of groups supports the conclusion that their creation was due to a lack of laboratory and hospital facilities and of specialists which existed in certain sections of the country. Two additional causes hastened this growth in the period immediately following the first World War. The war itself had taken many physicians away from their regular practice and accustomed them to work under military discipline where they were supplied facilities not available in many sections of the country. When these physicians returned they found in many cases that their practices had disappeared, and they sought a new start by associating in groups.

Another cause was the amazing growth of the Mayo Clinic during this period. It should be noted that although every propagandist of the sort of imaginary "model type" of group manages to leave the inference

This article is an abstract of the complete report, to be published as a pamphlet.

1. Group Practice, Bureau of Medical Economics, American Medical Association, Chicago, 1933. This also appeared in THE JOURNAL, May 20, 1933, p. 1695, May 27, p. 1693 and June 3, p. 1773.

that the Mayo Clinic belongs to this type, the truth is that this clinic has never shown any interest in prepayment plans, has always scrupulously observed medical ethics and makes charges according to the sliding scale. It is now a department of the graduate medical school of the University of Minnesota and is so far from being typical of group practice that it was not included in this study.

These three forces influencing the growth of groups—a sort of “pioneer” stage in medicine in certain localities, the effects of the World War and the example and influence of the Mayo Clinic—probably account for the fact that the twelve states of Texas, Wisconsin, Minnesota, California, Kansas, Oklahoma, Indiana, Illinois, Iowa, Nebraska, North Dakota and Michigan have 217 groups, or almost two thirds of the total reporting. These states contain about one third of the population. The Pacific states also have a number of groups, but there are few east of the Alleghenies.

There is a similar concentration in cities of from 2,500 to 250,000 population. As the accompanying table shows, cities of this size contain 300 out of 335, or about 90 per cent of all groups. These cities and states are exactly the ones which, during the period when groups were making their most rapid growth, had most inadequate hospital, laboratory and specialist facilities.

TABLE 1.—Location of Groups by Size of Cities

Size of City	Number of Groups	Cumulative Number	Cumulative Percentage
Less than 1,000.....	5	5	1.49
Less than 2,499.....	20	25	7.46
Less than 4,999.....	36	61	18.20
Less than 9,999.....	49	110	32.83
Less than 24,999.....	73	183	54.62
Less than 49,999.....	63	246	73.43
Less than 99,999.....	30	276	82.38
Less than 249,999.....	29	305	91.04
Less than 499,999.....	18	323	96.41
Less than 999,999.....	9	332	99.10
More than 1,000,000.....	3	335	100.00

The representatives of groups were asked to “comment on the financial, medical or other advantages or disadvantages of group practice.” Members of 215 out of 335 groups expressed some sort of opinion in response to this request. The most frequent comment simply stated that group practice was generally satisfactory. This was expressed sixty-nine times. There were sixty-seven representatives who listed the opportunity to go away for vacations or to attend medical meetings without losing their practice as an advantage. On the question of financial advantage there were twenty-nine who said that group practice was more expensive than private practice or returns less income to the physicians participating or offers no special financial advantage. There were only six who said that group practice increased the income of the physician. There was only one who stated that the group provided adequate care for less cost.

It is usually claimed that one of the greatest advantages of group practice is that it permits specialists’ services to be given to any patient when needed. This naturally raises the question of the number and type of specialists included in group practice. The standards of specialism are now in process of being determined by the examining boards of each specialty which issue certificates or diplomas to those who pass such boards. Those who have been so certified are listed as “accredited.” Those who were members of specialist

societies were so designated. Those who were simply listed by the groups as specialists were designated as “reported.” Table 2 shows the number and character of the credentials of the various specialists in group practice. It will be noted that the number of “reported” is almost as large as those who are accredited or members of specialists’ societies.

TABLE 2.—Classification by Specialists in 335 Groups

Type of Practice	Accred- ited	Member of Society	Reported	Total
Surgery.....	79	205	167	451
Internal medicine.....	110	57	229	396
Ophthalmology, otology, laryn- gology, rhinology.....	122	23	102	247
Obstetrics and gynecology.....	25	31	169	165
Pediatrics.....	34	9	52	95
Urology.....	29	17	47	93
Röntgenology and radiology.....	54	9	24	87
Orthopedies.....	20	11	21	52
Neurology and psychiatry.....	6	15	15	36
Dermatology.....	9	4	10	32
Pathology.....	16	3	5	24
Anesthesia.....	3	3	6	12
Proctology.....	..	..	5	5
Physical therapy.....	..	..	2	2
Tuberculosis.....	..	..	1	1
Total specialists.....	507	387	804	1,698
General practice.....	..	..	395	395
Total physicians in groups.....	..	..	..	2,093

An examination of this table makes it evident that there can be no distribution of these specialists among the 335 groups which will assure any such thorough research and diagnosis by specialists as is so often claimed to inhere in group practice. While obstetrics is one of the most commonly needed specialties there are only about one half as many obstetricians and gynecologists as there are groups. Analogous deficiencies with regard to radiologists and pathologists are evident.

There is no uniform type of financial organization and distribution of income among groups. About two thirds reported that they distribute their income to their members according to some agreed on percentage. There were fifty who said that their income was distributed mainly in the form of salaries. There were many excep-

TABLE 3.—Distribution of “Uncomplicated” Illnesses Among 8,758 White Families During Twelve Consecutive Months

Disease (Uncomplicated)	Total Number of Cases
..	10,835
..	2,253
..	3,537
Nervousness.....	220
Skin diseases.....	1,329
Rheumatism.....	769
Live births.....	735
Mens.....	212
Acic.....	2,015
“Other diseases” (12 total diseases).....	1,610
Total.....	23,515

tions of various types in both of these methods of distribution.

The statement is constantly repeated by some of the propagandists of group practice, many of whom have never been engaged in that type of practice, that the American Medical Association and its component societies have opposed group practice. An examination of the proceedings of the House of Delegates since 1904 fails to find a single example of any action hostile to the formation and operation of medical groups. During that period a number of Presidents of the American

Medical Association, including Drs. Charles H. and W. J. Mayo and E. Starr Judd and a considerable percentage of the other officials of the national organization and many of the state societies have been physicians who were members of groups. If there was any feeling of antagonism to groups, it would scarcely seem possible that the highest honors in the gift of organized medicine should be given to members of groups.

Whatever criticism has been directed against physicians as members of groups has been against individuals who have been charged with violating the Principles of Medical Ethics, which apply to all physicians regardless of whether they are practicing as individuals or as members of groups. Organized medicine has insisted that membership in a group with the introduction of lay business management does not exempt physicians from the same ethical obligations that are imposed on every member of the profession. Such membership does not justify solicitation or advertising or the adoption of methods of contract medicine which "make it impossible to render adequate service to the patient" or which in any other way interferes with the public welfare.

It has also been frequently urged, usually by lay advocates of some particular scheme of prepayment contract practice, that the general practitioner is incapable of giving adequate medical care to a large proportion of the illnesses which he may be called on to treat. This criticism is particularly directed against the statement frequently made by experienced physicians that the modern general practitioner, admittedly the best trained in the world, is capable of giving satisfactory service to about 85 per cent of the diseases occurring in an average community. Some North Carolina physicians have recently conducted a study to determine the accuracy of this judgment:²

In an effort to find out which of these views was correct, five Winston-Salem medical men tabulated an average of 200 consecutive cases each. Of the 1,000 patients thus reviewed 848—or 84.8 per cent—had been cared for without any other equipment than the contents of a handbag. A modern doctor's handbag, be it remembered, contains at least a blood pressure apparatus, a stethoscope, a hypodermic syringe, an otoscope, an ophthalmoscope, a transillumination light, a blood counting apparatus, glass slides, a hemoglobin scale, a pleximeter, tongue depressors, Wassermann tubes, culture tubes, and a few other odds and ends.

2. North Carolina M. J. 1: 320 (June) 1940.

In tabulating these cases, every patient who had to have a basal metabolism reading, an x-ray examination, an electrocardiogram, an operation or a surgical consultation or who was referred to a clinic for a diagnostic survey was included in the referred group—even if the doctor had his own basal metabolism apparatus or electrocardiograph. A considerable number of these referred patients, it should be noted, were beyond real help from any medical source: for example, some with arthritis, some with incurable mental disease and a few who literally enjoyed poor health too much to exchange it for an active existence.

A report recently issued by the United States Public Health Service of a study which was conducted for a wholly different purpose furnishes some facts pertinent to this question.³ This study analyzed the amount of each type of illness occurring during twelve consecutive months among 8,758 white families. Table 3 includes the illnesses listed classified as uncomplicated by the observers.

These cases of disease, which constitute primarily 72 per cent of the total of 32,752 cases suffered by the entire population surveyed, would seem to be susceptible of receiving adequate treatment by the individual practitioner. It is also reasonable to believe that at least 10 per cent of the other diseases listed would require no equipment beyond that available to the private practitioner.

In all of this it must be remembered that the general practitioner is not barred from the use of private and public laboratories and hospital facilities and that he can call in for consultation a much larger number of specialists than are to be found within the average group. One of the most important functions of the general practitioner is to act as the point of first contact with the patient, to determine his own capacities in the treatment of any illness, and then to act as adviser of the need and character of such other services as may be required and finally as a coordinator of such services.

The question of whether this function can best be fulfilled within or without a medical group is one on which there will always be differences of opinion and the answer to which will probably be warmly disputed and finally settled, not according to broad theoretical principles of medicine, economics or sociology, but largely according to the personal attitudes and inclinations of physicians and the local situations within which the question is posed.

3. Collins, Selwyn D.: Duration of Illness from Specific Diseases Among 9,000 Families Based on Nationwide Canvasses, 1928-1931, Pub. Health Rep. 55: 861 (May 17) 1940.

WOMAN'S AUXILIARY

THE NATIONAL MEETING IN CLEVELAND

At the annual meeting of the Woman's Auxiliary to the American Medical Association in Cleveland, June 2-6, the total registration was 1,400, including 150 delegates, 29 alternate delegates, 47 members of the National Board, 569 members and 605 guests. The registration at the annual meeting in New York last year was 1,321. The President, Mrs. V. E. Holcombe, Charleston, W. Va., reported that the total enrolment of members in the Auxiliary was 27,982, which represents a steady growth through the years, as in 1934 the membership was only 12,857.

In her president's message Mrs. Holcombe reviewed the activities of the Auxiliary during the last year and pointed out some of the important services that the groups are rendering in various states: Ohio, a newcomer to the ranks of the Auxiliary, already has more than 1,500 members in its first year. Mrs. Holcombe during the year of her presidency appeared on

various programs in thirty-two states, including state and county auxiliary meetings and many lay gatherings. Owing to conflicting engagements and demands of other duties, she was unable to accept invitations from the remaining states of the union. The growing appreciation of the work of the Auxiliary by some state medical societies, she said, is evidenced by the fact that they furnish funds for carrying on various auxiliary projects.

The President-Elect, Mrs. Roscoe E. Mosiman, Seattle, in her inaugural address said that "our obligation involves the education of the lay woman as well as the doctor's wife in those endeavors that make for a better health environment"; that *Hygeia*, the Health Magazine, is the finest instrument available for creating confidence in and appreciation for scientific medicine. A wider distribution of *Hygeia* in the public schools may in time greatly simplify the problems of health education. The President-Elect suggested that subjects particularly per-
pet-

nent to home defense be included in auxiliary programs this year, including problems of food conservation, an adequate diet for the civilian population and recreation projects; the practical application of knowledge along these lines which has been gained since the last World War has great possibilities with respect to home defense. The Auxiliary should assume at all times and under all conditions its share of responsibility for safeguarding the ideals of American medicine.

The Auxiliary voted unanimously to offer the following concrete plan to the Committee on National Defense of the American Medical Association:

1. To establish a housing registry in cities near military camps, with a list of graduated rentals for families of doctors who are stationed in the camps.
2. To provide some type of recreation for doctors and families and to help them in becoming oriented in their new environment.
3. To inform doctors when and where local medical society meetings are held and invite them to attend, thus providing for them a continuous contact with the activities of organized medicine.
4. To encourage doctors and their wives to keep in contact with their home medical societies and auxiliaries.
5. To encourage the home medical society and auxiliary to keep a record of the whereabouts of its members who are in the service of the United States Government and the defense setup.

Following are the newly elected officers of the Woman's Auxiliary to the American Medical Association:

- President, Mrs. Roscoe E. Mosiman, Seattle.
 President-Elect, Mrs. Frank Haggard, San Antonio, Texas.
 First Vice President, Mrs. John Bauer, Brooklyn.
 Second Vice President, Mrs. A. E. Anderson, Fresno, Calif.
 Third Vice President, Mrs. H. E. Christenberry, Knoxville, Tenn.
 Fourth Vice President, Mrs. P. R. Urnston, Bay City, Mich.
 Recording Secretary, Mrs. Samuel Flowers, Middlesboro, Ky.
 Treasurer, Mrs. David W. Thomas, Lock Haven, Pa.
 Directors for one year, Mrs. V. E. Holcombe, Charleston, W. Va., Mrs. Fred C. Oldenburg, Cleveland, Mrs. Eben J. Carey, Wauwatosa, Wis., and Mrs. Carlton F. Potter, Syracuse, N. Y.
 Directors for two years, Mrs. John B. Farley, Pueblo, Colo.; Mrs. James P. Simonds, Chicago, and Mrs. W. K. West, Oklahoma City.

CHAIRMAN OF STANDING COMMITTEES

- Archives—Mrs. Charles E. Sears, 2340 N. W. Flanders Street, Portland, Ore.
 Exhibits—Mrs. Ily R. Beir, 3900 Atlantic Avenue, Atlantic City, N. J.
 Finance—Mrs. Harold F. Wahlquist, 129 West Forty-Eighth Street, Minneapolis.
 Historian—Mrs. John J. Ryan, 2153 Iglehart Avenue, St. Paul.
 Hygeia—Mrs. George R. Dillinger, French Lick, Ind.
 Legislation—Mrs. Jesse D. Hamer, 1819 North Eleventh Avenue, Phoenix, Ariz.
 Organization—Mrs. John L. Bauer, 984 Bushwick Avenue, Brooklyn.
 Parliamentarian—Mrs. Robert E. Fitzgerald, 1761 Church Street, Wauwatosa, Wis.
 Press and Publicity—Mrs. George H. Ewell, Editor of Bulletin, 721 Seneca Place, Madison, Wis.
 Circulation Manager—Mrs. Charles H. Werner, 531 North Twenty-Fourth Street, St. Joseph, Mo.
 Program—Mrs. William Hibbits, 2524 Wood Street, Texarkana, Texas.
 Public Relations—Mrs. Frank P. Dwyer, 165 Sixth Street, Renovo, Pa.
 Revisions—Mrs. Eustace A. Allen, 18 Collier Road, N. W., Atlanta, Ga.
 Supplies—Mrs. J. E. Purdy, 327 Nineteenth Street, N. W., Canton, Ohio.
 Hygeia Committee—Mrs. George R. Dillinger, Chairman, French Lick, Ind.
 Western Region—Mrs. Leonard Brewer, Missoula, Mont.
 Southern Region—Mrs. W. W. Fowler, 920 Monett Street, Norman, Okla.
 Eastern Region—Mrs. H. V. Thomas, 511 Stanley Avenue, Clarksburg, W. Va.
 North Central Region—Mrs. R. L. Novy, 2910 Iroquois Avenue, Detroit.

The auxiliary voted to confer honorary membership on:

- Mrs. Willard C. Bartlett, St. Louis.
 Mrs. Franklin P. Gengenbach, Denver.
 Mrs. V. E. Holcombe, Charleston, W. Va.
 Mrs. John O. McReynolds, Dallas, Texas.
 Mrs. Samuel Clark Red, Houston, Texas.

California

One hundred members and guests from Los Angeles County were welcomed by the Long Beach branch at the Pacific Coast Club recently. The chief speaker was Miss Avis Lobdell, assistant to the president of the Union Pacific Railroad, whose talk was entitled "Romance of the Railroad."

The very active Butte County Group will henceforth be called the Butte-Glenn Auxiliary. Butte has just completed

a successful Hygeia drive and is now conducting a membership drive. The health chairman of the Santa Barbara P. T. A. Council appreciated the numerous copies of *Hygeia* which were placed in school libraries and teachers' rest rooms, the magazines having been donated by the Santa Barbara auxiliary members.

Georgia

The annual health meeting of the Woman's Auxiliary to the Fulton County Medical Society was held at Crawford Long Hospital March 7. The program was arranged by Mrs. W. M. Dunn, health education chairman. The subjects discussed were: "Public Health Service in Tuberculosis," by Dr. C. C. Aven; "Convalescent Care," by Dr. J. Moss Beeler; "The School Health Examination," by Dr. J. F. Hackney; "Nutrition in Georgia," by Dr. R. B. Schultz, and "Work of the Social Planning Council," by Miss Ruth Butler. Mrs. D. R. Longino and Mrs. M. T. Edgerton are chairmen of the public relations committee and Mrs. Olin S. Cofer is president of the society.

The Woman's Auxiliary to the Baldwin County Medical Society, of which Mrs. C. H. Richardson, of Milledgeville, is president, has received a \$25 check from *Hygeia*, the national health magazine published by the American Medical Association, for winning second place in the recent national subscription contest. *Hygeia* was placed in all schools in Baldwin County, the libraries, the five NYA homes, three beauty parlors and many private homes.

New York

About fifty members attended the meeting of Queens County auxiliary in Forest Hills recently. Mrs. Thelma Lippe reviewed several Broadway plays. Five new members were admitted to the auxiliary. More than four hundred attended the luncheon and bridge held at Pierre's recently. Thanks goes to Mrs. Edward Veprovsky and her committee for the successful result of their work. At the regular February meeting the speaker was Mr. Alfred Dickson of the speech department of Sarah Lawrence College and director of the "Theatre of the Air" on station WOV. His topic was "Speech, the Most Valuable Implement of Man."

OFFICIAL NOTES

THE ATLANTIC CITY SESSION

Time of Meeting

The Ninety-Third Annual Session of the American Medical Association will be held in Atlantic City, N. J., June 8 to 12, 1942.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—H. R. 2475 has passed the House and Senate, prohibiting prostitution within such reasonable distance of military and naval establishments as the Secretaries of War and Navy shall determine to be needful to the efficiency, health and welfare of the Army and Navy. H. R. 4258 has passed the House and Senate, providing that whoever brings on board or has in his possession or control on board any vessel of the United States any narcotic drug not constituting a part of the cargo entered in the manifest or part of the ship stores shall be subject to fine or imprisonment, or both.

Bill Introduced.—H. R. 5193, introduced by Representative Flannery, Pennsylvania, proposes to direct the Administrator of Veterans' Affairs, within the limits of Veterans' Administration facilities, to furnish domiciliary or hospital care, including medical treatment, to persons inducted into the land or naval forces of the United States under the provisions of the Selective Training and Service Act who are granted an honorable discharge from such service because of mental disorders which are not found to be due to such service.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

State Medical Election.—Dr. Rowland R. Robins, Camden, was chosen president-elect of the Arkansas Medical Society at its recent annual meeting and Dr. Herbert Fay H. Jones, Little Rock, was installed as president. Dr. William R. Brooksher, Fort Smith, was reelected secretary. The 1942 session will be in Fort Smith.

District Meetings.—The First Councilor District Medical Society met in Cash May 14. The speakers included Drs. Joel C. Land, Walnut Ridge, on "Nocturnal Enuresis"; Aaron Modelevsky, Jonesboro, "Monocytic Leukemia," and Isaac G. Duncan, Memphis, Tenn., "Symptoms, Diagnosis and Treatment of Hypertrophy of the Prostate." Dr. Eugene M. Holder of Memphis also spoke.—Mayor Keith of Magnolia opened the meeting of the Fifth Councilor District Medical Society May 13. Drs. Ben R. Buford and Jo C. Alexander, both of Dallas, Texas, spoke on "Serum Treatment of Pneumococcus Pneumonia" and "Urologic Problems in General Practice," respectively.

COLORADO

Midsummer Radiologic Conference.—The seventh midsummer radiologic conference of the Denver Radiological Club will be held at the Hotel Shirley-Savoy, Denver, July 31-August 1-2. The conference will open with addresses by Drs. Elizabeth H. Newcomer and William H. Halley, president of the Denver Radiological Club and the state medical society respectively. Guest speakers and their subjects will be:

- Dr. John D. Camp, Rochester, Minn., Roentgenologic Observations Concerning Osteoporosis and Its Relation to Systemic Diseases.
- Dr. Wendell G. Scott, St. Louis, Body Section Radiography as Aid in a Diagnosis of Thoracic Aneurysm or Mediastinal Tumors.
- Dr. Ross Golden, New York, Roentgenology of the Small Intestine.
- Dr. David S. Beilin, Chicago, Roentgen Therapy in Nonmalignant Conditions.
- Dr. Ursus V. Portmann, Cleveland, Irradiation for Diseases of the Thyroid Gland; Radiation Therapy in Endocrine Dysfunction.
- Dr. John T. Murphy, Toledo, Ohio, Carcinoma of the Skin.
- Dr. Leon J. Menville, New Orleans, Radiation Therapy in Endocrine Dysfunction.

Thursday evening July 31 there will be a joint meeting with the Medical Society of the City and County of Denver. Dr. Camp, Dr. Golden and Dr. Beilin will offer a symposium on the gastrointestinal tract and Dr. Menville and Dr. Portmann one on irradiation of cancer of the breast.

CONNECTICUT

Physician Named to Defense Council.—Dr. George M. Smith, Pine Orchard, chairman of the committee on medical preparedness, Connecticut State Medical Society, has been appointed a member of the state defense council. The governor of the state is chairman of the council. Its first meeting was held on May 12.

State Medical Election.—Dr. Roy L. Leak, Middletown, was chosen president-elect of the Connecticut State Medical Society and Dr. James D. Gold, Bridgeport, was installed as president at the recent annual meeting. Dr. Creighton Barker, New Haven, was reelected secretary. The 1942 session will be in Middletown during the second week in June.

Professor of Pathology Appointed at Yale.—Dr. Harry S. N. Greene, since 1935 associate in animal pathology at the Rockefeller Institute for Medical Research, Princeton, N. J., has been appointed professor of pathology and surgery at Yale University School of Medicine, New Haven, according to *Science*. A native of Woonsocket, R. I., Dr. Greene graduated at McGill University Faculty of Medicine, Montreal, in 1930. He was demonstrator in pathology at McGill from 1930 to 1931, when he joined the Rockefeller staff.

Changes in Clinical Thermometers.—The specifications for marking clinical thermometers sold in Connecticut have been changed. Manufacturers are now authorized to mark their thermometers with the abbreviation CONN followed by a designating letter which has been assigned to each manufacturer. In order to allow manufacturers to dispose of stocks

which have already been engraved in the old manner, a grace period will be allowed during which both types of engraving will be satisfactory. Thermometers engraved in the old manner with a CONN SEAL will be accepted as legal until Jan. 1, 1942. Thermometers engraved according to the new specifications will also be acceptable during the remainder of 1941. However, after Jan. 1, 1942 all clinical thermometers must be engraved according to the new specifications to be legal for sale in Connecticut. The abbreviation CONN and the designating letter may be engraved either in block letters or in script.

DELAWARE

Addition to Delaware Hospital.—An eight story addition to the Delaware Hospital was placed in service, June 9. The building is the second of three units in a \$3,500,000 expansion program. It provides new facilities for accident cases, service clinics, new and larger quarters for maternity cases, children's wards, outpatient administration, general wards and related services. Delaware Hospital handles 80 per cent of the accident and clinical cases in the city of Wilmington, it is reported. The third unit in the expansion program consists of a nurses' school and dormitory, which it is expected will be completed in November.

ILLINOIS

Physicians Honored.—Dr. Harry S. Bossart, Buckley, was guest of honor at a joint dinner of the staff of Iroquois Hospital, Watseka, and the Iroquois County Medical Society, held in recognition of his becoming a member of the fifty year club of the state medical society. Dr. Bossart practiced in Philadelphia for five years before coming to Buckley, where he has been for the last fifty years.—Two physicians of Belleville, Drs. Benjamin E. Twitchell and William Bahrenburg, were honored by the St. Clair County Medical Society, June 12, in recognition of their becoming members of the fifty year club of the state medical society.—A group of friends of Dr. George W. Michell, Peoria, gave a luncheon in his honor recently to observe his sixty-fifth birthday.—Dr. Alfred A. Knapp was honored by the Illinois State Medical Society and the Peoria City Medical Society at a dinner, May 14, to honor his recent completion of fifty years in the practice of medicine. He was presented with a plaque and button emblematic of membership in the fifty year club of the state society and with an engraved watch from the Peoria society. Dr. Knapp has practiced in Peoria for thirty years.

Chicago

Anesthetist Retires.—Dr. Isabella C. Herb, Hubbard Woods, Ill., retired on June 7 as head anesthetist of Presbyterian Hospital and clinical professor of surgery at Rush Medical College. She will continue her association with the hospital as anesthetist emerita. Dr. Herb graduated in 1892 at the Woman's Medical School of Northwestern University. While associated with the late Dr. Albert J. Ochsner, Chicago, early in her career, Dr. Herb assisted Dr. Lawrence H. Prince, now of Kilm, Miss., in developing the open drop method of ether administration. Later she served on the staff of the Mayo Clinic, Rochester, Minn., for five years as anesthetist and pathologist. After further graduate study in Europe, Dr. Herb carried on research in bacteriology under a grant from the American Medical Association and as an associate of Dr. Ludvig Hektoen. In 1909 she gave up her work in pathology and started again to specialize as an anesthetist, joining the staffs of both Presbyterian Hospital and Rush Medical College. She was the first woman appointed to the staff of Presbyterian Hospital and she is known as the anesthetist who first administered ethylene gas at actual operations. She was honored at a farewell tea at the hospital, June 6, and at the annual reunion luncheon of former Presbyterian interns, June 7. Dr. Mary M. Lyons, Ravinia, Ill., has been appointed head anesthetist at the hospital to succeed Dr. Herb.

Science Programs to Conclude Anniversary Celebration.—The University of Chicago will hold special symposiums during the week beginning September 22 to climax the celebration of its fiftieth anniversary. Thirty-nine universities, including six in foreign nations, and fifteen museums, research organizations and government agencies will be represented in the symposiums, which will deal with the newest fundamental advances in the biologic, physical and social sciences, the humanities, law, business, religion and social service, in keeping with the theme of the university's celebration, "New Fron-

tiers in Education and Research." Sessions in the biologic and physical sciences will be held jointly with the American Association for the Advancement of Science. The following symposiums and speakers are mentioned in an advance announcement:

Life at High Altitudes and Aviation Medicine: Dr. Carlos Monge, University of San Marcos, Lima, Peru; David B. Dill, Ph.D., U. S. Army Air Corps; Dr. E. S. Guzmán Barrón, Chicago, and Dr. Anton J. Carlson, chairman.

Thoracic Diseases: Drs. Everts A. Graham, St. Louis; John Alexander, Ann Arbor, Mich.; Clayton G. Loosli, William E. Adams, Robert G. Bloch and Oswald H. Robertson, Chicago, and Dallas B. Phenister, chairman.

Sex Hormones: Edward A. Doisy, Ph.D., St. Louis; Dr. John S. L. Brown, Montreal; Carl R. Moore, Ph.D., Dr. Allan T. Kenyon and Fred C. Koch, Ph.D., Chicago, and Frank R. Lillie, Ph.D., chairman.

Immunologic Mechanisms: Linus Pauling, Ph.D., Pasadena, Calif.; Dr. Thomas M. Rivers, New York; Drs. William Bloom, Paul R. Cannon and William H. Taliaferro, Ph.D., Chicago, and Dr. George F. Dick, chairman.

Visual Mechanisms: Selig Hecht, Ph.D., New York; Dr. Ernst Gellhorn, Chicago; Samuel H. Bartley, Ph.D., St. Louis; Karl S. Laszley, Ph.D., Boston; Drs. Arlington C. Krause and Theodore J. Case, Heinrich Klauer, Ph.D., and Dr. Stephen Polyak, chairman.

Levels of Integration in Biologic and Social Systems: Clarence R. Carpenter, Ph.D., Pennsylvania State College and School of Tropical Medicine, San Juan, P. R.; Alfred L. Kroeber, Ph.D., Berkeley, Calif.; Robert E. Park, Ph.D., Nashville, Tenn., and Alfred E. Emerson, Ph.D., Chicago, and Robert Redfield, Ph.D., chairman.

All the chairmen are from Chicago. The tentative program also lists special lectures by Drs. Charles H. Best, Toronto, and Ernest W. Goodpasture, Nashville, Tenn., on immunologic mechanisms.

INDIANA

Memorial to Dr. Wishard.—The June issue of the *Journal of the Indiana State Medical Association* was designated the "Wishard Memorial Number" in honor of Dr. William N. Wishard Sr., who at the time of his death on January 22 was professor emeritus of genitourinary surgery, Indiana University School of Medicine, Indianapolis. Dr. Wishard participated actively in the work of organized medicine throughout his career, serving in many official capacities for the state board of health, his county and state medical societies and the American Medical Association.

Personal.—Dr. John W. Palmeier, Sandborn, has been appointed health officer of Knox County, succeeding the late Dr. Joseph L. Reeve, Edwardsport.—Dr. Sherman S. Frazier was guest of honor at a meeting of the Angola Lions Club, recently, in observance of his completion of fifty years in the practice of medicine. Dr. Frazier died, June 10.—Dr. Daniel C. Barrett, medical director of the health unit at Washington, Iowa, has been appointed to a similar position with the Bloomington district of the Indiana State Board of Health, succeeding Dr. Lewis C. Robbins, who has gone to Washington, D. C., to join the U. S. Public Health Service, it is reported.

KANSAS

State Medical Election.—Dr. Henry N. Tihen, Wichita, was chosen president-elect of the Kansas Medical Society at its annual meeting in Topeka in May and Dr. Clyde D. Blake, Hays, was installed as president. Other officers include Drs. John L. Lattimore, Topeka, and Marion S. Trueheart, Sterling, vice presidents. Drs. John M. Porter, Concordia, and George M. Gray, Kansas City, were reelected secretary and treasurer, respectively. Wichita was chosen as the place for next year's meeting.

LOUISIANA

Unveil Medallion in Honor of Dr. Matas.—Special ceremonies to dedicate a medallion in Touro Infirmary, New Orleans, were held, June 24, in honor of Dr. Rudolph Matas, who until his retirement in 1935 had been affiliated with the institution since 1895. A bronze plaque carrying the likeness of Dr. Matas, executed by Mrs. J. Higginson Manning, New Orleans, was unveiled by Dr. Isidore Cohn, who succeeded Dr. Matas in 1935 as chief surgeon of the infirmary. Speakers included Charles Rosen, president of Touro Infirmary, who traced the days of Dr. Matas' early affiliation in 1895, through his appointment as chief surgeon in 1905 and his voluntary retirement to become emeritus chief surgeon, and Dr. Marcus J. Magruder, oldest living former intern on Touro's active staff and a member of the board of administrators of Tulane University of Louisiana School of Medicine, where Dr. Matas taught for many years. Dr. Matas received the *Times-Picayune*

Loving Cup for 1940, it was announced on June 28. This is an award given by the newspaper since 1901 to a New Orleans citizen for achievement redounding to the benefit of the city and its people.

MARYLAND

Dr. Meyer Retires.—Dr. Adolf Meyer, since 1910 professor of psychiatry, Johns Hopkins University School of Medicine, and director of the Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital, Baltimore, retired at his own request at the end of the academic year, according to *Science*. He will be succeeded by Dr. John Clare Whitehorn, professor of psychiatry, Washington University School of Medicine, St. Louis. Dr. Meyer was born near Zurich, Switzerland, in 1866. He received his degree in medicine at the Universität Zürich Medizinische Fakultät, Switzerland, in 1892, when he came to the United States. He was honorary fellow and later docent in neurology at the University of Chicago, 1892-1895; pathologist to the Illinois Eastern Hospital for the Insane, Kankakee, 1893-1895; pathologist and later director of clinical and laboratory work, Worcester (Mass.) Insane Hospital and docent in psychiatry, Clark University, Worcester, Mass., 1895-1902; director of pathology (psychiatric) institute, New York State Hospitals, 1902-1910, and professor of psychiatry, Cornell University Medical College, 1904-1909. He went to Johns Hopkins in 1910. He has been honorary president of the National Committee for Mental Hygiene and president of the International Committee for Mental Hygiene since 1937. He is an honorary member of many psychiatric societies and was president of the New York Psychiatric Society, 1905-1907, American Neurological Association, 1922, American Psychiatric Association, 1927, American Psychopathological Association in 1912 and 1916. The April 1937 issue of the *Archives of Neurology and Psychiatry* was dedicated to Dr. Meyer to mark his seventieth birthday and the twenty-fifth anniversary of the founding of the Henry Phipps Psychiatric Clinic. He has been a member of the editorial board of the *Archives* since 1929. He has contributed extensively to the literature on neurology, pathology and psychiatry. Dr. Whitehorn graduated at Harvard Medical School, Boston, in 1921.

MASSACHUSETTS

Fund for Study of Asthma.—The late Robert Stanley Forsythe, Chicago, bequeathed \$100,000 to Harvard University for research in the cause and cure of asthma, as a memorial to his deceased wife, who suffered from asthma throughout her life. The grant will be known as the Nell Lucas Forsythe Memorial Fund, newspapers reported.

Personal.—The annual alumni prize awarded by the Governor Dummer Academy to the alumnus of the school who has achieved distinction subsequent to graduation has been given to Dr. Storer P. Humphreys, Newbury, in charge of Neurological Hospital number 1 in England. Dr. Humphreys graduated at the academy in 1922.—Dr. Huston K. Spangler, former assistant superintendent of Worcester City Hospital, has been elected superintendent of Belmont Hospital, Worcester, filling the unexpired term of Dr. May S. Holmes, who retired on May 12, *Hospital Management* reports.

MINNESOTA

State Medical Election.—Dr. Herbert Z. Giffin, Rochester, was elected president of the Minnesota State Medical Association at the annual meeting in May to take office January 1. Other officers include Drs. Norman H. Baker, Fergus Falls, and Stephen B. Haessly, Faribault, vice presidents. Drs. Benjamin B. Souster, St. Paul, and William H. Condit, Minneapolis, were reelected secretary and treasurer, respectively. Duluth was chosen for the meeting in 1942, June 29-July 1.

MISSOURI

Dental Year Book Dedicated to Physician.—The *Bushwhacker*, year book of the Kansas City Western Dental College, 1940-1941 edition, has been dedicated to Dr. Edward L. Stewart, Kansas City, professor of bacteriology and histology at the dental college from 1904 to 1938. Dr. Stewart was also at one time professor of bacteriology at the University Medical College of Kansas City (Mo.), which was discontinued in 1913. He graduated in 1903 at the Kansas City (Mo.) Medical College, later absorbed by the University of Kansas School of Medicine. In 1907 he founded the *Bulletin* of the Jackson County Medical Society, which is still published by the society.

NEVADA

Meeting of Indian Service Physicians.—At a meeting of physicians of the U. S. Indian Service for the state of Nevada in Reno recently the speakers included:

- Dr. John J. Colbert, Schurz, Pyelitis.
 Dr. Leo F. Corvino Jr., Reno, Diagnosis of Acute Appendicitis.
 Dr. Gerald J. Sylvain, Goldfield, state epidemiologist, Differential Diagnosis of Typhoid.
 Dr. Olin C. Moulton, Reno, Common Diseases of the Conjunctiva.
 Dr. Joseph H. Coogan, field physician, Report on Three Hundred Cases of Diphtheria.
 Dr. Horace DeLien, San Francisco, Tuberculin and Coccidioidin Survey at the Carson Indian School.
 Dr. James Thom, Carson City, Common Surgical Conditions Among the Indians.

Dr. Ralph B. Snively, San Francisco, district medical director, conducted a round table discussion.

NEW YORK

Society News.—Dr. Karl M. Bowman, New York, addressed the Dutchess County Medical Society, Poughkeepsie, June 11, on "Military Psychiatry."—Dr. Samuel J. Kopetzky, New York, addressed the Medical Society of the County of Monroe, Rochester, May 29, on "The Doctor's Place in the Defense Program."—Dr. Joseph H. Barach, Pittsburgh, addressed the Glens Falls Academy of Medicine, May 29, on "Present Day Treatment of Diabetes and Its Complications." Dr. Barach also spoke at the Albany Medical College, Albany, the same day on "Inheritance and Tumors."—Dr. Frederick A. D. Alexander, Albany, discussed shock at a meeting of the Medical Society of the County of Albany, June 25.

New York City

Dr. Rous Honored.—The Royal College of Surgeons of England has awarded its Walker Prize for Cancer Research to Dr. Francis Peyton Rous of the Rockefeller Institute for Medical Research. Dr. Rous has also been elected an honorary fellow of the Royal Society of Medicine of London, according to *Science*.

Hospitals Organize Catastrophe Units.—Twelve hospitals in the city have organized catastrophe units capable of transporting to the scene of any major disaster a corps of specially trained physicians and nurses with equipment comparable to that of a first aid station. Hospitals that have completed organization are Bellevue, Kings County, Queens General, Morrisania, Presbyterian, New York, Roosevelt, Fordham, Cumberland, Greenpoint, Coney Island and Sea View. Within the medical zones mapped by the department of hospitals are included other hospitals whose ambulances will respond simultaneously with the central catastrophe unit and, while first aid is being administered on the spot, will evacuate patients requiring hospitalization, the seriously injured to the nearest hospital and the less seriously injured to hospitals as directed by the doctor in charge. The announcement pointed out that these catastrophe units are complete and immediately available should there be occasion to integrate them with the defense program.

City to Establish Research Institute.—The City Council and the Board of Estimate have authorized the establishment in the New York City Department of Health the Public Health Research Institute of New York, Inc., to be used exclusively for scientific research "essential for the protection and the improvement of the health, safety and welfare of the people of New York City," the health commissioner, Dr. John L. Rice, announced, June 28. The new institute will be directed by a lay board to supervise the business management and a research council to retain the necessary scientific personnel. Dr. Thomas M. Rivers, director of the Hospital of the Rockefeller Institute for Medical Research and a member of the city board of health, is chairman of the research council. Other members are Dr. Eugene L. Opie, professor of pathology, Cornell University Medical College; Henry C. Sherman, Ph.D., professor of chemistry, Columbia University; Michael Heidelberger, Ph.D., associate professor of biochemistry, Columbia University College of Physicians and Surgeons; Dr. George Baehr, clinical professor of medicine at Columbia, and Dr. Ralph S. Muckenfuss, director of the bureau of laboratories of the health department, ex officio. Members of the board of directors are David M. Heyman of the banking firm of Adolph Lewisohn and Sons, president; David Rockefeller, vice president; David Morse, attorney, secretary; Edwin P. Chindlund, treasurer; Mayor La Guardia, Joseph D. McGoldrick and Dr. Rice, the last three ex officio. The institute will be established with an appropriation of \$100,000 included in the

1941-1942 budget of the health department. Partly to offset this expenditure, the health department recently began charging \$1 per person for premarital tests for syphilis. Under the terms of the contract with the city the institute may receive and accept grants, gifts, bequests, devices and contributions from private or foundation sources. Heretofore a limited amount of research has been carried on in the bureau of laboratories through a corporate structure known as Health Research Fund, Inc., which was empowered to accept voluntary gifts. This corporation has been absorbed by the new institute. Any scientific results that accrue from the research institute will become the property of the city, the announcement said. Headquarters of the new unit will be in the William Hallock Park Laboratory at the foot of East Fifteenth Street.

NORTH CAROLINA

Society News.—Dr. Karl Schaffle, Asheville, addressed the Buncombe County Medical Society, Asheville, June 2, on pulmonary hemorrhage.—Drs. James G. Johnston and Roy B. McKnight, Charlotte, addressed the Mecklenburg County Medical Society, Charlotte, June 3, on "Subconjunctival Injections in Diseases of the Eye" and "The Goiter Problem" respectively.

Personal.—Dr. Raymond S. Crispell, associate professor of neuropsychiatry, Duke University School of Medicine, Durham, has been ordered to active duty in the U. S. Navy, with the rank of lieutenant commander. Dr. Crispell will teach neuropsychiatry and participate in research and clinical work in psychology and psychiatry at the Naval School of Aviation Medicine at the Naval Air Training Station at Pensacola, Fla.

Appointments at Bowman Gray School.—Dr. William Allan, Charlotte, has been appointed head of a department of eugenics at the new Bowman Gray School of Medicine of Wake Forest College, which is to open in Winston-Salem in the fall, it is reported. The department will be financed by a grant from the Carnegie Foundation of New York, according to a newspaper report. Dr. Allan is visiting professor of medicine at the Medical College of Virginia, Richmond, and is director of a family record department at Memorial Hospital in Charlotte. He has recently made a statewide survey of hereditary traits. Dr. James B. Whittington, medical director of the City Hospital of Winston-Salem, has been appointed head of a department of hospital administration. Dr. Whittington is president-elect of the North Carolina Hospital Association and past president of the Medical Society of the State of North Carolina.

OREGON

Personal.—Dr. John R. Seeley has resigned as health officer of Coos County to enter private practice.—William Levin, D.P.H., director of the hygienic laboratory of the state board of health for the past eighteen years, has been called to military service.—Drs. John E. Weeks, honorary professor of ophthalmology, and Albert A. Mackay, emeritus professor of urology, received honorary degrees of doctor of science at the annual commencement of the University of Oregon Medical School, Portland.

Society News.—Speakers at a meeting of the Multnomah County Medical Society, Portland, May 7, were Drs. James B. Haworth, on "X-Ray Treatment of Infections"; Donald E. Forster, "Vitamin B Complex," and Merl L. Margason, "Migraine." Speakers at the May 21 meeting included Dr. Lester R. Chauncey on "Relationship of Serum Proteins to Gastric Retention." All are of Portland.—Dr. Arthur C. Jones, Portland, addressed the Marion-Polk Counties Medical Society, Salem, May 13, on "Some Aspects of Manipulative Surgery."—Dr. Harold A. Myers, Dallas, Texas, stationed at the new air base at Pendleton, discussed "Aviation Medicine" at a meeting of the Umatilla County Medical Society, May 13.

PENNSYLVANIA

Society News.—Dr. Russell L. Haden, Cleveland, addressed the Washington County Medical Society, Washington, June 11, on gout.—Dr. Ralph M. Tyson, Philadelphia, addressed the Locoming County Medical Society, Williamsport, June 13, on "The Management of Children."—Dr. Roy R. Snowden, Pittsburgh, discussed "Newer Concept of Hypertension" at a meeting of the Cambria County Medical Society, Johnstown, June 12.—Charles E. Vanderkleed, Ph.D., Philadelphia, addressed the Blair County Medical Society, Altoona, May 27, on "Vegetable Drugs with Special Reference to Digitalis."

Philadelphia

Hahnemann to Admit Women.—Hahnemann Medical College recently announced that women students will be admitted to the school for the first time next year. A prospective dearth of physicians because of increasing demands by the military forces was one of the reasons for the decision, according to the Philadelphia *Inquirer*.

Personal.—Dr. Joseph C. Doane has been appointed a member of the board of health of Philadelphia.—Dr. Charlotte Silverman has received a fellowship awarded by the American Association of University Women for a year's study of public health at Columbia University College of Physicians and Surgeons, New York.—Dr. David A. Cooper, associate in medicine, University of Pennsylvania School of Medicine, has been appointed chief of the division of tuberculosis of the city department of health. He succeeds Dr. Seth A. Brumm.

Pittsburgh

Society News.—Dr. Charles W. Mayo, Rochester, Minn., addressed the Pittsburgh Surgical Society, June 12, on "Malignancy of the Lower Colon: Evaluation of the One Stage Combined Abdominoperineal Resection."—Dr. Robert T. Frank, New York, addressed the Pittsburgh Obstetrical and Gynecological Society at its annual meeting, May 24, on "The Present Status of Endocrinology as It Pertains to Obstetrics and Gynecology."

RHODE ISLAND

State Medical Meeting and Election.—Dr. Frederic V. Hussey, Providence, was elected president of the Rhode Island Medical Society at the annual meeting in Newport, June 1. Vice presidents elected were Drs. John Paul Jones, Wakefield, and Charles F. Gormly, Providence. Dr. William P. Buffum, Providence, was elected secretary to succeed Dr. Guy W. Wells, Providence. The speakers were:

- Dr. Frank H. Lahey, Boston, then President-Elect of the American Medical Association, Developments in Medicine and Surgery.
- Dr. William P. Murphy, Boston, Management of the Patient with Chronic Leukemia.
- Dr. Leland S. McKittick, Boston, Diagnosis and Treatment of Cancer of the Right Colon.
- Dr. Willard O. Thompson, Chicago, Sex Hormones: Clinical Application.
- Charles A. Stuart, Ph.D., Providence, Paracolon Bacteria and Their Possible Etiological Significance in Gastrointestinal Disturbances.
- Drs. Bertram H. Buxton and Charles Potter, Providence, X-Ray Localization of the Placenta and the Clinical Application.
- Dr. Benjamin Earl Clarke, Providence, Interapillary Glomerular Sclerosis or Diabetes-Nephrosis Syndrome.

The morning sessions were devoted to clinics and exhibits at the Newport Hospital and U. S. Naval Hospital.

WISCONSIN

New Society of Obstetrics.—The Wisconsin Society of Obstetrics and Gynecology held its first meeting in Milwaukee, May 16, with Dr. Norman F. Miller, Ann Arbor, Mich., as the guest speaker on "The Cervix in Health and Disease." Other speakers included Drs. Carlton L. Wirthwein, Milwaukee, on "Diagnosis and Management of Premature Separation of the Placenta"; John J. Boersma, Sheboygan, "Edema in Toxemia of Pregnancy," and John W. Harris, Madison, "Causes and Prevention of Fetal Asphyxia." Officers of the society, which was organized in the fall of 1940, are Drs. Roland S. Cron, Milwaukee, president; John W. Harris, Madison, vice president, and Robert E. McDonald, Milwaukee, secretary. Meetings are to be held twice a year.

Institutes on Chest Diseases.—For the second year the Wisconsin Anti-Tuberculosis Association has arranged ten one day institutes on diseases of the chest to be given in ten towns between July 21 and August 1. The towns are Kaukauna, Rhinelander, Superior, Rice Lake, Stevens Point, Kenosha, Madison, Platteville, Sparta and Fond du Lac. The program will consist of a symposium on roentgen rays; lectures on significance of primary tuberculosis, differential diagnosis of diseases of the chest and pulmonary abscess; a motion picture on artificial pneumothorax, and a round table discussion of sanatorium versus home treatment of tuberculosis. The lecturers this year will include Drs. Joseph W. Gale, Reuben H. Stiehm, William H. Oatway Jr., Madison; George C. Owen, Oshkosh; Harold M. Coon, Statesan; Oscar Lotz, Arthur A. Pleyte, John D. Steele Jr., John A. Carswell and Edward K. Steinkopf, Milwaukee. The state board of health, the state and county medical societies and the county sanatoriums are cooperating in the institutes, which are made possible by a fund left to the antituberculosis association by the late Dr. Hoyt E. Dearholt, Milwaukee.

GENERAL

Meeting of Food and Drug Officials.—The Association of Food and Drug Officials of the United States held its forty-fifth annual conference in St. Paul, June 9-13. Included among the speakers were Drs. Lon O. Weldon, U. S. Public Health Service, liaison officer with the Sixth Corps Area, U. S. Army, Chicago, on "The Liaison Plan of the U. S. Public Health Service with Military Authorities"; Joseph W. Mountin of the public health service, Washington, D. C., "The Miscellany of Partnerships in Food and Drug Control at the State Level" and Theodore G. Klumpp, former chief of the drug division, U. S. Food and Drug Administration, Washington, and recently appointed Director of the Division of Foods, Drugs and Physical Therapy of the American Medical Association, Chicago, "The Philosophy of the Administration of the Drug Sections of the Food, Drug and Cosmetic Act."

Institute of History of Pharmacy.—An American Institute of the History of Pharmacy has been established at the University of Wisconsin, Madison, according to *Science*. The institute will be a center for pharmaceutico-historical information and work in both North and South America. George Urdang, D.Sc.Nat., formerly director of the German Society of the History of Pharmacy, is to be the director. Dr. Urdang has been associated with the university since July 1939. Arthur H. Uhl, Ph.D., director of the department of pharmacy at the university, is president of the institute; Mr. Jennings Murphy, Milwaukee, president of the Wisconsin Pharmaceutical Association is secretary, and vice presidents are Bernard V. Christensen, Ph.D., dean of the Ohio State University School of Pharmacy, Columbus; Dr. Rufus A. Lyman, of the department of pharmacy at the University of Nebraska, Lincoln, and J. Leon Lascoff, Pharm.D., New York.

Meeting of Academy of Arts and Sciences.—At the annual meeting of the American Academy of Arts and Sciences in Boston, May 14, the Amory Prize of \$17,200 was awarded to three American scientists and one European scientist whose name was not given because he is living in a country now under German control (*THE JOURNAL*, March 1, p. 881). The Americans were Drs. Joseph F. McCarthy, New York, and Hugh H. Young, Baltimore, and Carl R. Moore, Ph.D., Chicago. The prize money for the fourth recipient will be held in trust for him in this country. The prize, awarded for the first time, recognized the contributions of these investigators to the treatment and cure of diseases of the genitourinary system. At this meeting Dr. Simeon Burt Wolbach, Boston, was elected vice president for the natural and physiologic sciences and Drs. Fuller Albright, Walter Bauer and Alan R. Moritz, Boston, were elected to membership. Dr. Bernardo Alberto Houssay, Buenos Aires, the Argentine endocrinologist, was elected to foreign honorary membership.

Association for Internal Secretions.—Edgar Allen, Ph.D., New Haven, Conn., was elected president of the Association for the Study of Internal Secretions at its annual meeting in Atlantic City, May 2-3, and Dr. Henry H. Turner, Oklahoma City, was chosen secretary. The session was held under the presidency of Dr. Elmer L. Sevringhaus, Madison, Wis., who delivered his address at the annual dinner Friday evening. Among the speakers on the program were:

- Dr. Maurice H. Friedman and Samuel Hall, Beltsville, Md., Site of Elaboration of Prolactin and Gonadotropin.
- R. P. Reece and Samuel L. Leonard, Ph.D., New Brunswick, N. J., Effect of Estrogens, Gonadotropins and Growth Hormone on Mammary Glands of Hypophysectomized Rats.
- Drs. Abraham E. Rakoff, Abraham Cantarow and Karl E. Paschke, Philadelphia, Cushing's Syndrome: Two Cases Treated with Stilbestrol.
- Roger F. Varney, A.B., Dr. Allan T. Kenyon and Fred C. Koch, Ph.D., Chicago, An Association of Short Stature, Defective Sexual Development and High Titters of Urinary Gonadotropins in Young Women.
- Drs. Francis Raymond Keating Jr. and Edward H. Ryneerson, Rochester, Minn., Desoxycorticosterone in Prevention of Surgical Shock.
- Dr. Harry B. Friedgood, Boston, Inanition and Nervous System Effects on the Menstrual Cycle.

Fraudulent Sales Agents.—S. B. Debour, Publishers, Chicago, recently reported that an agent named A. G. Comstock has been sending orders with forged signatures and has taken orders from physicians without reporting such orders to the firm. He is also said to have taken books from physicians who ordered them on approval and who wished to return them. Complaints of these fraudulent transactions have been received from Rochester and Syracuse, N. Y., the firm said. The firm is trying to apprehend Comstock.—The Better Business Bureau of Columbus, Ohio, reports an agent who is said to have victimized physicians in Ohio, Indiana, Pennsylvania, Michigan and New York. This man, who has in some instances used the name of Barlow, takes orders for stationery

and office supplies, collecting a down payment in the name of the "Specialty Sales Company." The bureau reports that it has not been able to locate such a firm in Columbus, the address given being that of a drug store. Any one having knowledge of such an agent is requested to communicate with the Columbus Better Business Bureau, 35 East Gay Street, Columbus.

Special Society Elections.—Dr. Tracy J. Putnam, New York, was elected president of the Harvey Cushing Society at the tenth annual meeting in Rochester, N. Y., May 29-31; Dr. Edgar A. Kahn, Ann Arbor, Mich., vice president and Dr. Louise C. Eisenhardt, New Haven, Conn., secretary. The next meeting will be held in San Francisco.—Dr. Samuel M. Feinberg, Chicago, was named president-elect of the American Association for the Study of Allergy at the annual meeting in Cleveland, June 2-3, and Dr. Milton B. Cohen, Cleveland, became president. Dr. Oscar Swineford Jr., Charlottesville, Va., was elected vice president and Dr. James Harvey Black, Dallas, Texas, reelected secretary.—Dr. Logan Clendening, Kansas City, Mo., was named president-elect of the American Association of the History of Medicine at the recent annual meeting in Atlantic City and Dr. Jabez H. Elliott, Toronto, Ont., became president. Dr. Henry E. Sigerist, Baltimore, was reelected secretary.—Dr. Nathaniel P. Rathbun, Brooklyn, was chosen president-elect of the American Association of Genito-Urinary Surgeons at the annual meeting in Hot Springs, Va., in May and Dr. Homer G. Hamer, Indianapolis, became president. Dr. Charles C. Higgins, Cleveland, was reelected secretary.—Philip E. Smith, Ph.D., New York, was elected president of the American Association of Anatomists at the recent annual meeting in Chicago. Dr. Eliot R. Clark, Philadelphia, is the secretary.—Dr. W. Likely Simpson, Memphis, Tenn., was elected president of the American Broncho-Esophageological Association at the annual meeting in Cleveland, June 3; Dr. Robert L. Moorhead, Brooklyn, vice president, and Dr. Paul H. Holinger, Chicago, was reelected secretary.—Dr. Lewis J. Pollock, Chicago, was elected president of the American Neurological Association at the annual meeting in Atlantic City in June. Drs. Edward A. Strecker, Philadelphia, and Abraham Myerson, Boston, were elected first and second vice presidents, respectively, and Dr. Henry A. Riley, New York, was reelected secretary.

CANADA

Dr. Best Succeeds Banting.—Dr. Charles H. Best, professor and head of the department of physiology at the University of Toronto Faculty of Medicine, has been appointed director of the Banting-Best Department of Medical Research to succeed the late Sir Frederick Banting. Dr. Best will resign as associate director of the Connaught Laboratories, where he has been in charge of the purification and production of insulin since its discovery, according to the *Canadian Medical Association Journal*.

LATIN AMERICA

Guggenheim Latin American Fellowships.—The John Simon Guggenheim Memorial Foundation has announced the award of twenty fellowships to Latin American scholars and artists for study in the United States, the largest number awarded in any one year since the fellowships were established in 1929. Nine of the fellowships are in medical and related fields, and the recipients are:

Dr. Anibal Silveira, neurologist at the Juqueri Hospital, São Paulo, Brazil, who will study the electrical activity of the cortex of the brain.

Dr. Nilson Torres de Rezende, Pernambuco, Brazil, who will continue investigation in neurophysiology.

Dr. Washington Buño, head of the histology laboratory, Institute of Endocrinology, Montevideo, Uruguay, who will conduct research in primate embryology in collaboration with Dr. George W. Corner at the Carnegie Institution Laboratory of Embryology, Baltimore.

Dr. Luis Vargas Fernández of the National Health Service of Chile, Santiago, who will study endocrine pathology.

Dr. José Ribeiro do Valle, of the University of São Paulo Faculty of Medicine and Butantan Institute, São Paulo, Brazil, who will study endocrinology.

Dr. Americo Santiago Albrieux Murdoch of the Institute of Endocrinology, Montevideo, Uruguay, who will study endocrinology.

Dr. Mauricio Rocha e Silva, Biological Institute of São Paulo, who will work in biochemistry at the Rockefeller Institute for Medical Research, New York.

Dr. Otto Guilherme Bier, assistant chief of the department of serology at the São Paulo Biological Institute, who will study immunity phenomena with Michael Heidelberger, Ph.D., at Columbia University College of Physicians and Surgeons, New York.

Dr. Efrén Carlos del Pozo, professor of physiology, National School of Biological Sciences, Mexico City, will study the electrical stimulation of muscle at Harvard Medical School, Boston.

FOREIGN

Germans Suffer for Lack of Physicians.—Germany has called so many of its physicians into the army that civilian patients are suffering for lack of attention, according to a report in the *New York Times*, June 17. The report was originally published in the *Basler Nachrichten* of Basle, Switzerland, and summarized by the London office of the International Federation of Trade Unions. There are about sixty-eight thousand physicians in Germany. In Berlin alone more than one thousand have been called up, it was said. More than half of those in Brandenburg have gone to the army and in Pomerania there is now one doctor for every four thousand five hundred inhabitants. Many of those now practicing are between 60 and 75 years old, the report said. It was said also that patients are visited in their homes only in urgent cases, that patients often have to wait in physicians' offices from four to ten hours and that the physicians are overworked to the limits of their endurance.

Government Services

Arab Collection Added to Army Library

A group of sixty-three Arabian manuscripts was recently purchased from an Arab scholar for the Army Medical Library, newspapers reported. Their authenticity is said to be beyond question. It was stated that the existence of some of these medical works had not been known before. Others are copies of fairly well known medieval books. All are on paper, whereas European manuscripts of that period were written on vellum. One anonymous manuscript presents at length a discussion of the theory of circulation of the blood by the court physician of the Sultan Muhamed Bahadur, dated 1488, it was stated.

Incidence of Trichinosis in Washington, D. C.

A four year study by the zoology division of the U. S. Public Health Service has disclosed that one sixth of the population of Washington, D. C., carries the trichinosis parasite. This figure was obtained from the examination of 3,000 specimens of postmortem material provided by ten Washington hospitals, four U. S. naval hospitals and two U. S. marine hospitals in eastern seaboard cities. Of the 2,330 specimens obtained from Washington hospitals 362, or 15.5 per cent, were infested with trichinae, and the remaining 670 specimens, which came from service hospitals in other cities, were 18.8 per cent infested. Washington was selected as the chief source of material because of the cosmopolitan nature of its population. The percentage of persons carrying the organism in the 3,000 specimens is believed to indicate the extent of infestation to be found in similar population groups in other parts of the United States. The infestation is believed to be less in rural areas, and a survey of these areas is now being made by the zoology division of the National Institute of Health. A release from the U. S. Public Health Service states that, despite popular opinion, health service zoologists believe the practice of feeding raw garbage to hogs is more to blame for trichinosis in human beings than eating improperly cooked pork.

Dr. McGibony Named Director of Health of Indian Service

Dr. John R. McGibony has been appointed director of health of the U. S. Indian Service. He succeeds Dr. James G. Townsend, director of Indian health from 1933 to 1941, who was recalled from the Indian Service by the U. S. Public Health Service in February to become director of industrial hygiene at the National Institute of Health. Dr. McGibony is also detailed to the Indian Service from the public health service, where he has held a commission since 1936. A graduate of the University of Georgia School of Medicine, Augusta, in 1927, his first public health assignment was at the quarantine station at San Francisco. At the close of the fiscal year 1940 there were seventy-eight general hospitals and twelve sanatoriums in the Indian Service, exclusive of Alaska, with a total of 4,523 beds. There are eight hospitals in Alaska. A release from the Office of Indian Affairs states that more Indians each year are availing themselves of hospital facilities. Of 5,756 Indian live births reported last year, 4,464, or 77.6 per cent, were in Indian Service hospitals, while another 763 were attended by Indian Service physicians in homes, making a total of 949 per cent of obstetric service to Indian mothers.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 17, 1941 (delayed).

The Civilian Casualties of Air Raids

The Ministry of Home Security has just given the figures of civilian casualties in air raids on Britain during April: killed, 6,065; injured and detained in hospitals, 6,926. The killed are classified into men 2,192, women 2,418, children under the age of 16 years 680, unclassified 55. The injured are classified into men 3,659, women 2,748, children 519. In addition, 61 (48 men, 6 women and 7 children) are missing and are believed to have been killed. The figures for the preceding three months of the year are as follows: March: killed 4,259, injured 5,557; February: killed 789, injured 1,068; January: killed 1,502, injured 2,012. For the last four months of 1940 the figures were: December: killed, 3,793, injured 5,044; November: killed 4,588, injured 6,202; October: killed 6,334, injured 8,695; September: killed 6,954, injured 10,615.

The total casualties for the four months January-April are 28,178. These are a great reduction on those for the last four months of 1940, which were 52,225. The casualties from the many thousands of tons of high explosives dropped on this thickly populated country, in which more than half of the people live in towns and cities and much damage has been done to buildings, may seem comparatively small. The explanation is that many more would have occurred but for the elaborate air raid precautions.

Research in Aviation Medicine: Collaboration with the United States and Canada

Lieut. Gen. A. G. L. McNaughton, commander of the Canadian Overseas Force and president of the National Research Council of Canada, described research in Canada at the Royal Society of Arts. Dealing with aviation medicine, he said that a very important program had been initiated under the chairmanship of the late Sir Frederick Banting. On the business of this committee Sir Frederick was traveling to England when he lost his life. A great range of work was going forward in Canada in the closest sympathy and understanding both with the authorities in Britain and with friends and colleagues in the United States. The British government established a scientific liaison officer with the Research Council in Ottawa, which had received at first Professor Fowler and later Sir Lawrence Bragg. At present senior members of the National Research Council of Canada are in England familiarizing themselves with the latest methods and requirements, so that their work may be kept related to problems of immediate practical importance. There is a constant flow and interchange of workers, and there is no delay in making the results available for application and use.

The Canadian National Research Council owes its birth to the last great war, when it became apparent how essential was the part played by science in war. At the outbreak of the present war there were, in contrast to the position in 1914, laboratories and trained staffs competent to act as a nucleus in the study of scientific problems of all kinds arising out of the needs of war, while the council has been able to establish intimate relations with other organizations, whether connected with the government, the universities or industry concerned with different aspects of the work. Dr. James B. Conant, president of Harvard, has only just returned to America from a mission similar to that of the Canadians. Every effort is being made to pool the scientific brains of the three countries. Long as the start of Germany in stealthy preparations, she should be overtaken by superior capacity for scientific initiative and invention.

Hospitals Carry on

The heroic story of the Westminster Hospital is only one example of what has occurred throughout the country. This hospital received direct hits which blew out all the windows and cracked or broke down many walls. But it never ceased to function. Within a week the outpatient department and fifty beds were again available in the wards, to be increased to one hundred and sixty-nine in a fortnight and to two hundred and ninety-two in three weeks. One side of the hospital has been put out of action and has been sealed off. When a bomb struck the hospital an operation had just been completed, but though the four occupants of the operating room were buried knee deep in debris, only a slight scratch was received by one of them. Bad casualties had to be admitted and were treated in the wards and others at the first aid post attached to the hospital. During the raid the patients in the wards were evacuated to the basement while fires raged around the hospital and even one on its fourth floor. A basement room was quickly fitted up as an operating room and received casualties during the whole time. Dr. O'Brien, a representative of the Rockefeller Trust, was present. Afterward he wrote to the minister of health praising the courage and skill shown by all concerned in dealing with a frightful situation and commenting on the complete absence of panic or hysteria among the patients.

Diet and the War

The present war can be described as the greatest of all the calamities of the world, but, like others, it will no doubt prove to have brought some benefits in its train. One that is being realized is reform of the English diet, of which the three principal faults in normal times are too much meat, too much sugar (especially in the case of children), and that degraded product white bread. As meat is rationed to the amount per week which can be bought for 24 cents, it is not now possible to eat too much. The same holds for sugar, which is rationed to 8 ounces a week. Since the middle of the nineteenth century, when stone grinders gave place to steel rollers for the grinding of flour, removing the whole of the germ and practically all the bran, the white loaf has been the popular bread. Diet reformers attacked it with little effect, and even a press campaign had little permanent effect. Even some authorities on diet treated the loss as of little importance on the grounds that the defects of white bread could be made good by other articles of diet. This is no doubt true for persons on a liberal diet, but these authorities forgot the large proportion of the population whose resources are limited. But since the discovery of vitamins the tide of authority has strongly set in against white bread as deficient in protein, fat, vitamins A and B and minerals. As a war measure the government has ordered the production of a national wheatmeal loaf which, in consequence of higher extraction from the wheat, is free from these deficiencies. But, as befits a democracy, people are free to eat the white loaf.

Opening a food education week at Colwyn Bay, Lord Horder attacked some widely held opinions. He said that there was nothing essential in orange juice or in bananas that could not be obtained from vegetables if only we ate more of them. Children had been overfed with sugar for so long that we had come to regard it as essential rather than as a bad habit. For years doctors had been saying to eat less sugar and meat. He advocated the more general use of salads and also the new loaf made from more highly extracted flour.

Sir James Frazer

Sir James Frazer, F.R.S., the greatest authority on cultural anthropology in the world, has died at Cambridge at the age of 87. His wife, a French woman, who assisted him in his work, died a few hours later. His most important work was "The Golden Bough," which instantly made him famous and

has profoundly influenced the modern attitude toward the supernatural. Educated at Cambridge, he broke new ground in 1887 with his book on totemism, which grew into a work of four volumes. He was appointed professor of social anthropology by the University of Liverpool in 1907. In that year he contributed to a volume of anthropologic studies in memory of E. B. Taylor and in 1909 to the Darwin Centenary Essays. In 1911 he delivered the Gifford lectures at St. Andrews University, taking the subject of "Belief in Immortality and the Worship of the Dead." In 1918 appeared "Folk-Lore in the Old Testament." On comparative religion he had a strong spiritual affinity with Renan, on whose centenary in 1923 he gave an address at the Sorbonne to a distinguished audience which included the president of the French republic.

RIO DE JANEIRO

(From Our Regular Correspondent)

May 29, 1941.

The Federal Department of Health

President Getulio Vargas has signed a decree reorganizing the national department of health. This reorganization and enlargement emphasize the interest that the present government has taken in problems relating to public welfare and gives to the federal bureau of health a status near that of a ministry. All activities related to problems of health under the federal government, with the exception of those concerning the child, have been consolidated under a general director in the Ministry of Education and Health. Even the well known Oswaldo Cruz Institute, which previously enjoyed the position of an independent institution of research and study in the general field of experimental medicine, has been included in the new organization. The decree states that the national department of health will promote surveys, research relating to health, sanitation and hygiene, the epidemiology of diseases and the methods of their control and treatment and will directly administer the activities connected with these problems and others related to health.

Dr. J. de Barros Barrcto, an able sanitarian and executive, has been appointed director general of the department.

The national department of health is composed of several divisions: the division of public health organization, which cooperates with the states and counties to create and run local health units; the division of hospitals, which is intended to foster throughout the country the creation and improvement of hospitals, a matter in which Brazil is well below her necessities, and the division of tuberculosis and the division of leprosy. The federal government has already appropriated and paid to more than twelve of the twenty states of Brazil the means to build and equip sanatoriums, preventoriums and leprosariums. The division of yellow fever includes the well known organization developed with the cooperation of the International Health Board of the Rockefeller Foundation. The work against Aedes in the cities, which have been practically free of the disease for several years, and the work against "jungle yellow fever," still prevailing in many rural communities, including the extensive use of viscerotomy and vaccination, is already being performed by Brazilian personnel. The Rockefeller Foundation operates the Yellow Fever Laboratory, built within the premises of the Oswaldo Cruz Institute, where research is carried on and the vaccine is prepared. The division of malaria is expected to expand the antimalarial work. The federal bureau of health was already doing the work against malaria, especially in the Federal District (suburbs of Rio de Janeiro City), in the neighboring state of Rio de Janeiro and in the Gambia infected northeast area (states of Ceara and Rio Grande do Norte), the latter area where the Rockefeller Foundation has cooperated extensively. Other divisions are devoted to mental diseases,

health education, plague, vital statistics, maritime quarantine and the licensing of drugs.

Among the new functions of the Oswaldo Cruz Institute is the function of the education of public health medical specialists, as the course in hygiene and public health has been transferred from the medical school of the University of Rio de Janeiro to the institute.

Diphtheria in Rio de Janeiro

In Rio de Janeiro, a tropical city of nearly two million population, the prevalence of transmissible diseases is declining slowly in spite of the inclusion of antepartum and infant hygiene, industrial hygiene and even mental hygiene in the program of the official health organization of the capital city. It is true that the crude death rate for all causes in Rio de Janeiro has declined from 30 per hundred thousand of population at the beginning of the century to 15 last year, a reduction of 50 per cent in forty years. But the city itself has been much improved, and this, even without considering public health administration, should explain the reduction of the death rate. During this period yellow fever, plague and smallpox have been completely conquered. A bad situation, however, still exists with diphtheria, a disease against which we are well armed with laboratory diagnosis, antitoxin, toxoid, hospital isolation and public health nurses. If extensively used, these tools would afford considerable reduction in the disease. But the actual situation is different. Beginning with the period 1908-1912 up to 1936-1940, the crude death rate for diphtheria was 4.77, 6.41, 7.00, 6.28, 6.72, 7.10 and 6.99. Rio de Janeiro has a mean temperature for the whole year of 73 F.; the mean for January (the warmest month) is 81 F., and that for July (the coolest month) is 68 F. For many years it has been common to hear that diphtheria is less prevalent in tropical climates than in temperate ones. But the great improvements in public health work in the temperate climate, in contradistinction to the relative slowness in the tropics, has changed this situation. New York City, for instance, had a crude specific death rate for diphtheria of 14.0 per hundred thousand of population in 1920-1924 as against 7.00 for Rio de Janeiro, and the great American metropolis has won its way down to 0.6 per hundred thousand of population for 1935-1939, as against 6.9 for Rio de Janeiro. More significant is the fact that for the most important eighty-eight American cities, with an aggregate population of about thirty-one million people, the rate was 13.13 (for 1923) and this rate has dropped to 0.83 in 1939 for an aggregate of more than thirty-eight million population (Diphtheria Mortality, THE JOURNAL, May 11, 1940, p. 1878). The Public Health Department of Rio de Janeiro is improving its work against diphtheria, but much more remains to be done to conquer the disease.

Photodynamic Action of Sulfanilamide

Dr. Genesio Pacheco, biologist of the Oswaldo Cruz Institute, studied experimentally the photodynamic action of sulfanilamide, using paramacia and common water spirochetes. He used a solution of azosulfamide and yellow eosin Grubler for comparison. Both solutions, to which the paramacia and spirochetes had been added, were exposed to the radiation of a "punktlicht" Zeiss lamp at the distance of 20 cm., for fifteen, thirty, sixty and one hundred and twenty minutes. The concentration of both the sulfanilamide and the eosin varied from 10^{-2} to 10^{-4} . Dr. Pacheco concluded that sulfanilamide has a marked photodynamic action, as the concentration of 10^{-2} immobilized the spirochetes in fifteen minutes and the paramacia in thirty minutes. The photodynamic action of sulfanilamide was stronger than that of eosin. There is no doubt, therefore, of a direct relationship between the action of light and the production of dermatotoxic reactions.

NEWS FROM GERMANY

(Compiled from recent German periodicals)

Number of Persons in Medical Services

The number of persons professionally engaged in the therapeutic and nursing services was 299,900. This was 1,621, or 0.5 per cent, higher than in the previous year. The licensed physicians have decreased by 2,007, or 4 per cent, also the midwives by 632, or 2.6 per cent, and the pharmaceutical assistants and probationers by 357, or 8.5 per cent.

Up to Jan. 1, 1939 female nurses had increased by 3,200 (3 per cent) compared to Jan. 1, 1938. Male nurses had decreased by 158, or 0.8 per cent. Of all the nursing personnel 48.1 per cent (previous year 48.2 per cent) belonged to a denominational nursing organization. The numerical relationship between female nurses (114,923) and male nurses (20,527) has shifted in favor of the women nurses. The ratio is now 5.6:1. Of the nursing personnel not connected with a denominational organization 39,630, which is 1,450 more than in the preceding year, had been approved by the government. However, the nursing personnel without government approval (30,658) likewise increased slightly (249). Other groups connected with medical services have likewise increased; thus the licensed apothecaries increased by 613, or 5.2 per cent; the increase in infants' and children's nurses was 369, or 3.5 per cent, in licensed dental physicians 173, or 1.2 per cent, in dentists 153, or 0.7 per cent, in disinfectors 49, or 0.8 per cent, in bath assistants, therapeutic assistants, masseurs and gymnastic instructors for patients 61, or 0.5 per cent, in puerperal nurses and not licensed therapeutic practitioners 0.3 per cent each.

On Jan. 1, 1939, 14,992, or 31.4 per cent, of the physicians (previous year 33.1 per cent) were approved specialists. Compared to Jan. 1, 1938 the number of specialists has decreased by 1,445, or 8.8 per cent. Women specialists decreased from 918 in 1938 to 841 in 1939 (minus 8.4 per cent). In the previous year women specialists amounted to 5.6 per cent of the total number of specialists. The largest numerical decrease, compared to the previous year, was in the specialists for skin and venereal diseases (minus 18.8 per cent), the specialists for children's diseases (minus 17.4 per cent) and the specialists for neurology and psychiatry (minus 12.5 per cent). It is probable that the elimination of Jewish physicians is most noticeable in these specialties. The number of surgeons and radiologists remained practically unchanged. The number of midwives decreased during 1938 by 632, or 2.6 per cent. The number of midwives counted on Jan. 1, 1939 was 1,296 in institutional service and 22,449 in private practice. Those in private practice, according to the records of the professional association, assisted at 1,007,000 deliveries during 1938. Thus, if all deliveries (life and stillbirths) of 1938 (1,378,369) are counted, there were 58 deliveries for every midwife in private practice (*Klin. Wchnschr.* 19:800 [Aug. 3], 848 [Aug. 17] 1940).

Organization of Obstetrics

The reichs health leader and head of the department of health, Dr. Conti (*Klin. Wchnschr.* 19:904 [Aug. 31] 1940) issued "Guiding Principles for the Organization of Obstetrics." These principles were developed in collaboration with the German Society for Gynecology. The recommendations and demands are addressed to physicians and midwives, to the organizations of these professions and to the responsible offices of the state and the party. Midwives, general practitioners, specialists and maternity hospitals form an obstetric work community which is to be strengthened by mutual support and aid. This fundamental attitude is also to be the basis of all discussions about these problems. Public propaganda is not suited for this obstetric work community. Birth is not an illness but a natural process. Fear of childbirth is unjustified. Everything that can produce or intensify this fear must be avoided. The management of normal births by midwives in the home is to

be encouraged. If complications threaten, the parturient woman finds the best assistance in the obstetric institutes. All pregnant women of whom delivery is complicated and those in whom complications can be anticipated must be sent early to good obstetric institutes. The direct commitment to an obstetric institute by a midwife, in accordance with the regulations of the instruction book for midwives, remains in force. However, in case of an unexpected complication in the course of a home delivery, a physician experienced in obstetrics is to be called in, who has to decide whether transfer to an obstetric hospital is desirable. The obstetric teaching institutes are the foundations on which rest all obstetrics. Poor institutes are foci of danger, particularly as regards puerperal infection. If they cannot be improved, they must be closed. Obstetric institutes are to be provided for regions that are inadequately supplied. Prospective mothers who are to be delivered at home should be instructed to avail themselves of the services of the midwife provided by law as early as possible after the onset of pregnancy. The pregnant woman should report all abnormal manifestations to the midwife, who will arrange for consultation by a physician. The organization of consultations for pregnant women is the legal obligation of the health departments. The prospective mother has absolutely free choice as to where she wants to be delivered. The possibilities for conducting normal deliveries at home should be promoted everywhere. The state must provide for thorough obstetric training of physicians. The reichs health leader has instructed the leader of the lay practitioners to the effect that the practice of obstetrics by lay practitioners is out of the question.

Withdrawal of Right to Practice from Non-Aryan Physicians in Bohemia and Moravia

On July 24, 1940 non-Aryan physicians in the protectorate Bohemia-Moravia lost their right to practice under the governmental decree No. 136/40. They were obliged to remove on this day all inside and outside signs pertaining to medical practice. More detailed regulations have been issued by the ministry for those Jewish physicians provided for the Jewish population (*Klin. Wchnschr.* 19:872 [Aug. 24] 1940).

Japanese-German Medical Society

The president of the Japanese-German Medical Society, Dr. Ishibashi, with seven other Japanese physicians, was in Germany for the study of important German institutions. This visit will lead to closer collaboration between Japanese and German medical science (*Klin. Wchnschr.* 19:928 [Sept. 7] 1940).

Marriages

GEORGE AUGUSTINE GODER, Chicago, to Miss Elizabeth Mitchell Flynn of Arlington Heights, Ill., June 28.

ROBERT MARK FINKS, Nashville, Tenn., to Miss Josephine Elizabeth King at Murfreesboro, April 5.

JULIUS L. SANDHAUS, Lancaster, Pa., to DR. BEATRICE S. WEISBERG of Philadelphia, April 27.

FREDERIC H. STEELE, Huntingdon, Pa., to Miss Charlotte Kearney of Reynoldsville, June 28.

ALFRED PENN CRAIN JR., Shreveport, La., to Miss Paula Potts of Natchitoches, April 27.

TOM WILEY HODGES, Boston, to Miss Mary Granville Eastham of Culpeper, Va., in April.

SAMUEL A. SHUSTER to Miss Norma Greenberg, both of Atlantic City, N. J., July 6.

NELSON ROBERT SAPHIR to Miss Grace Elizabeth McIntire, both of Boston, June 22.

RAYMOND S. TICE, Akron, Ohio, to Miss Irene Hensel of Kent, recently.

GEORGE E. TWENTE to Miss Alma Weber, both of Cairo, Ill., April 22.

Deaths

Walter Wile Hamburger @ Chicago; Rush Medical College, Chicago, 1906; clinical professor of medicine, University of Chicago, The School of Medicine; formerly assistant clinical professor of medicine at his alma mater; member of the Central Society for Clinical Research, Association of American Physicians and the American Society for Clinical Investigation; formerly member of the board of directors and treasurer of the American Heart Association; member of the executive committee of the board of governors of the Institute of Medicine of Chicago; served as a major during the World War; at one time on the staff of the Cook County Hospital; for many years senior attending physician on the staff of the Michael Reese Hospital; aged 59; died, June 27, in Lake Lure, N. C., of coronary thrombosis.

Sydney William Johnston @ Vicksburg, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1899; member of the House of Delegates of the American Medical Association from 1924 to 1926; past president of the Mississippi State Medical Association; fellow of the American College of Surgeons; past president and secretary of the Warren County Medical Society; formerly professor of clinical and operative surgery at the University of Mississippi School of Medicine, University; past president of the county school board; at one time surgeon in charge of the Mississippi State Charity Hospital; aged 62; died, May 29, in the Vicksburg Sanitarium, of coronary thrombosis.

Elza Marion Perry, Dallas, Texas; University of Texas School of Medicine, Galveston, 1925; member of the State Medical Association of Texas; associate professor of clinical neuropsychiatry at the Baylor University College of Medicine since 1938, assistant professor from 1935 to 1938, and instructor from 1927 to 1935; director of the Dallas Child Guidance Clinic from 1927 to 1935; aged 39; associate neuropsychiatrist, Parkland Hospital and the Baylor Hospital, where he died, May 21, of injuries received in an automobile accident, May 6.

Otto Carl Gaub @ Pittsburgh; University of Pennsylvania Department of Medicine, Philadelphia, 1894; member of the American Surgical Association; fellow of the American College of Surgeons; formerly member of the advisory committee of the city department of health; past president of the Pittsburgh Academy of Medicine; member of the founders' group of the American Board of Surgery; on the staff of the Allegheny General Hospital; on the staff of the Columbia Hospital, Wilkesburg, Pa.; aged 67; died, May 22.

Leon Thayer Stern @ Sarasota, Fla.; University of Tennessee Medical Department, Nashville, 1909; member and past president of the Tennessee State Medical Association; past president of the Chattanooga and Hamilton County Medical Society; fellow of the American College of Physicians; served during the World War; formerly on the staffs of the Baroness Erlanger Hospital and the Pine Breeze Sanatorium, Chattanooga, Tenn.; aged 57; died, May 15, of uremia due to mitral regurgitation.

Charles Harvey McCully @ Logansport, Ind.; Eclectic Medical Institute, Cincinnati, 1893; Medical College of Indiana, Indianapolis, 1897; member of the House of Delegates of the American Medical Association in 1910; past president of the Indiana State Medical Association and the Cass County Medical Society; served during the World War; formerly county health commissioner; examiner for the city draft board; aged 73; died, May 21, of heart disease.

Arlett Bryan Hartman, Wilkesburg, Pa.; University of Cincinnati College of Medicine, 1922; joined the medical service of the Pennsylvania National Guard in the grade of first lieutenant on Dec. 23, 1926, was promoted to captain on May 17, 1930 and to major on May 13, 1937, attached to the 176th Field Artillery, 29th division; aged 44; died, April 4, in his quarters at Fort Meade, Md., of coronary occlusion.

Harry West Rollings, Wardsville, W. Va.; Columbian University Medical Department, Washington, D. C., 1893; at one time a captain in the medical reserve corps of the United States Army; formerly medical officer in charge of the rating section of the United States Veterans' Bureau in Washington, D. C.; aged 75; died, May 23, at the home of his son in Richmond, Va., of carcinoma of the liver.

James W. MacDonald, Aurora, Ill.; Northwestern University Medical School, Chicago, 1892; member of the Western Surgical Association; formerly chairman of the city board of health and health commissioner; aged 74; on the staffs of St. Charles Hospital and St. Joseph Mercy Hospital, where

he died, May 21, of hypostatic pneumonia and chronic myocarditis.

Jacob Deets Lower, Coshocton, Ohio; University of Wooster Medical Department, Cleveland, 1887; member of the Ohio State Medical Association; also a pharmacist; secretary of the Coshocton County Medical Society; served during the World War; formerly county coroner and city health commissioner; aged 76; died, May 20, of coronary occlusion.

Harold Goodman Von Goldberg @ Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1900; fellow of the American College of Surgeons; consulting ophthalmic surgeon, Misericordia, Episcopal and Kensington hospitals; aged 65; died, May 11, at Tryon, N. C., of hypertension and cardiovascular disease.

Leonard Holmes Bush, Huntsville, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1892; member of the State Medical Association of Texas; fellow of the American College of Surgeons; visiting surgeon, Huntsville Memorial Hospital; aged 75; died, May 14, of coronary thrombosis.

Roland Houston Cranford, Laurel, Miss.; Memphis (Tenn.) Hospital Medical College, 1906; formerly a member of the state board of health; on the staff of the Laurel General Hospital; formerly superintendent of the South Mississippi Charity Hospital; aged 61; died, May 21, of angina pectoris and acute nephritis.

William Henry Wilson, Joliet, Ill.; Hahnemann Medical College and Hospital, Chicago, 1898; fellow of the American College of Physicians; member of the American Society of Clinical Pathologists; for many years on the staff of the Silver Cross Hospital; aged 74; died, May 15, of cerebral thrombosis.

Simeon J. Hesterly, Prescott, Ark.; Memphis (Tenn.) Hospital Medical College, 1896; member of the Arkansas Medical Society; member of the city council from 1912 to 1916; county health officer from 1910 to 1920; on the staff of the Cora Donnell Hospital; aged 77; died, May 2, of coronary occlusion.

Joseph Price Ball, Philadelphia; Medico-Chirurgical College of Philadelphia, 1898; member of the Medical Society of the State of Pennsylvania; one of the founders and for many years a consulting physician on the staff of the Frankford Hospital; aged 76; died, April 15, of cerebral thrombosis.

Stanley Earle Copeland, Worcester, Mass.; Harvard Medical School, Boston, 1928; member of the Massachusetts Medical Society and the New England Otological and Laryngological Society; aged 39; on the staffs of the Hahnemann Hospital and the City Hospital, where he died, May 13.

Edward Stanley Berry, Shippensburg, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1894; formerly medical director of Cumberland County; member of the board of trustees of the Teachers College; aged 69; died, May 22, of arteriosclerosis and organic heart disease.

Edna Simpson Valentine @ Columbia, S. C.; Woman's Medical College of Pennsylvania, Philadelphia, 1910; member of the American Psychiatric Association; medical director of the Waverly Sanitarium; aged 57; died, May 1, in the Providence Hospital of bronchial asthma and pneumonia.

William Calvin Ussery, Paris, Ky.; Medical College of Ohio, Cincinnati, 1890; past president of the Bourbon County Medical Society; for many years on the staff of the W. W. Massie Memorial Hospital; aged 79; died, May 3, of heart disease following chronic bronchiectasis.

John Steele Sweeney, Paris, Ky.; Kentucky School of Medicine, Louisville, 1898; member of the Illinois State Medical Society; veteran of the Spanish-American and World wars; aged 63; died, May 20, in the Veterans Administration Facility, Lexington, of cirrhosis of the liver.

Paul H. Herron, Oak Ridge, La.; Rush Medical College, Chicago, 1931; member of the Louisiana State Medical Society and the American Academy of Pediatrics; health officer; aged 37; was accidentally killed, May 10, by an x-ray machine which had been short-circuited.

James Ellis Carson, Maryville, Tenn.; University of Tennessee College of Medicine, Memphis, 1912; member of the Tennessee State Medical Association; served during the World War; owner and superintendent of the Fort Craig Hospital; aged 59; died, May 13.

Pedro Juan Carreras, Philadelphia; Jefferson Medical College of Philadelphia, 1918; member of the Medical Society of the State of Pennsylvania; on the staff of St. Mary's Hospital; aged 49; died, May 15, of injuries received in an automobile accident.

Robert Newton Spire Young, Brooklyn, Miss.; University of the South Medical Department, Sewance, Tenn., 1907; member of the Mississippi State Medical Association; served during the World War; aged 61; died, May 5, of coronary thrombosis.

James J. Walsh, Danville, Ill.; Loyola University School of Medicine, Chicago, 1917; on the staff of the Veterans Administration Facility; aged 54; died, May 8, in the Veterans Administration Facility, Hines, of carcinoma of the urinary bladder.

Bertram Henry Beckwith, Saginaw, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1892; veteran of the Spanish-American War; aged 74; died, May 17, in the Grace Hospital, Detroit, of carcinoma of the cecum.

Joseph Warren Bailey, Chattanooga, Tenn.; St. Louis College of Physicians and Surgeons, 1901; Chattanooga Medical College, 1908; aged 75; died, May 18, in Erlanger Hospital of diabetes mellitus, gangrene of the left foot and uremia.

George Ross Winters @ Pittsburgh; University and Bellevue Hospital Medical College, New York, 1899; fellow of the American College of Surgeons; consulting surgeon, South Side Hospital; aged 68; died, May 1.

Elizabeth E. Gross, Kansas City, Mo.; Kansas City Homeopathic Medical College, 1896; aged 74; died, May 10, in the Trinity Lutheran Hospital of arteriosclerosis, diabetes mellitus and chronic nephritis.

Clifton L. Green, Utica, Miss.; Memphis (Tenn.) Hospital Medical College, 1899; member of the Mississippi State Medical Association; aged 64; died, May 15, in a hospital at Jackson of cardiorenal disease.

Harry De Forest Browning @ Hamilton, Mont.; Rush Medical College, Chicago, 1892; president of the staff of the Marcus Daly Memorial Hospital; aged 72; died, May 20, of cerebral hemorrhage.

Welcolm Tol Kelley, Pinehurst, Ga.; University of Georgia School of Medicine, Augusta, 1937; member of the Medical Association of Georgia; aged 30; died, May 8, in an automobile accident.

Vittorio E. Von Brunow, Pampa, Texas; (licensed in Texas under the Act of 1907); formerly postmaster; aged 78; died, May 7, in the Worley Memorial Hospital of uremia and cardiorenal disease.

Abram C. Leggat, Ferguson, Mo.; Washington University School of Medicine, St. Louis, 1895; served during the World War; aged 68; died, May 12, in the De Paul Hospital, St. Louis, of heart disease.

Andrew Jackson Clay, St. Charles, Mo.; St. Louis University School of Medicine, 1918; member of the Missouri State Medical Association; aged 51; died, May 20, in Augusta of heart disease.

Edward Paxton Daviss, Houston, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1885; aged 80; died, May 23, of coronary occlusion and arteriosclerosis.

Joseph Nicholas Applewhite, Capron, Va.; Medical College of Virginia, Richmond, 1895; member of the Medical College of Virginia; aged 74; died, May 5, of carcinoma of the stomach.

William Frederick Coombs, Cazenovia, N. Y.; Syracuse University College of Medicine, 1920; aged 46; died, May 22, in St. Joseph's Hospital, Syracuse, of acute nephritis and uremia.

Jason Wilson Carson, Indiana, Pa.; Jefferson Medical College of Philadelphia, 1902; member of the Medical Society of the State of Pennsylvania; aged 80; died, May 21.

Charles H. Alford, Franklin, Ind.; Medical College of Indiana, Indianapolis, 1891; also a druggist; aged 71; died, May 12, of arteriosclerosis and gangrene of the foot.

Wilfred Cornell Allen, West Hartford, Conn.; New York Homeopathic Medical College and Hospital, New York, 1888; aged 74; died, May 21, of carcinoma of the colon.

Henry Hiram Pantton @ Corsicana, Texas; St. Louis University School of Medicine, 1905; served during the World War; aged 59; died, May 14, of angina pectoris.

Charles Culp Cooner, Vineland, N. J.; Jefferson Medical College of Philadelphia, 1905; served during the World War; aged 61; died, May 12, of cerebral hemorrhage.

Ira Marshall Fisher, Oriental, N. C.; University College of Medicine, Richmond, 1913; aged 60; died in May of carbon monoxide poisoning self administered.

Charles W. Evans, Middlesboro, Ky.; University of Pennsylvania Department of Medicine, Philadelphia, 1884; aged 81; died, April 12, of bronchopneumonia.

Manley Lane Morgan, Luverne, Ala.; Birmingham Medical College, 1903; member of the Medical Association of the State of Alabama; aged 70; died, May 13.

Hans Weil @ Mount Vernon, N. Y.; Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, Germany, 1923; aged 42; died, May 8.

R. Johnson Dickerson, San Antonio, Texas; University of Nashville (Tenn.) Medical Department, 1908; aged 62; died, May 12, of chronic myocarditis.

Eugene H. Burrigge, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1877; aged 85; died, May 13, of cerebral hemorrhage.

Joseph Anthony Bianco, Boston; Harvard Medical School, Boston, 1904; member of the Massachusetts Medical Society; aged 58; died, May 23.

George Ferdinand Hanker, Kerhonkson, N. Y.; University of the City of New York Medical Department, 1892; aged 81; died, May 9.

Oscar U. Chenoweth @ LaFayette, Ind.; Rush Medical College, Chicago, 1901; aged 64; died, May 26, of cerebral hemorrhage.

John Coakley McCarthy, Malden, Mass.; Harvard Medical School, Boston, 1891; aged 71; died, May 22, of coronary thrombosis.

Alexander Porter Giles, Humboldt, Kan.; Rush Medical College, Chicago, 1883; aged 84; died, May 20, of coronary occlusion.

William L. Abney @ San Juan, P. R.; Washington University School of Medicine, St. Louis, 1908; aged 57; died, May 12.

Manley Adair Shipley, Kirkland Lake, Ont., Canada; University of Toronto Faculty of Medicine, 1925; aged 44, died, April 8.

Henry Perkins Fitzpatrick, Chicago; Rush Medical College, Chicago, 1896; aged 73; died, May 14, of organic heart disease.

Herbert Beck @ New York; Uniwersytet Jagielloński Wydział Lekarski, Cracow, Austria, 1891; aged 74; died, May 9.

Edmund Lennon Quinn, Chicago; University of Pennsylvania School of Medicine, Philadelphia, 1910; aged 62; died, May 5.

George Douglas Lockhart, King, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1890; died, May 17.

Lena M. Whitcomb, Albany, Wis.; Hahnemann Medical College and Hospital, Chicago, 1892; aged 76; died in May.

Abraham Kahn, New York; Long Island College Hospital, Brooklyn, 1921; aged 47; died, May 9, of coronary thrombosis.

Thomas Clinton Seright, Chatsworth, Ill.; Jefferson Medical College of Philadelphia, 1889; aged 79; died, April 29.

Daniel Willis Rounds, Malden, Mass.; Bellevue Hospital Medical College, New York, 1891; aged 74; died, May 1.

Conway Alonzo Frost, Utica, N. Y.; Bellevue Hospital Medical College, New York, 1890; aged 74; died, May 10.

George M. Shaw, Robinsonville, Miss.; Memphis (Tenn.) Hospital Medical College, 1892; aged 78; died, April 26.

George W. Stevens, Austin, Texas; Memphis (Tenn.) Hospital Medical College, 1889; aged 81; died in May.

Henry Blumzweig, Philadelphia; Temple University School of Medicine, Philadelphia, 1917; aged 48; died, May 18.

Wallace K. Mock, Cleveland; Eclectic Medical Institute, Cincinnati, 1889; aged 76; died, May 24, of pneumonia.

Robert Waide, Long Beach, Calif.; Physio-Medical College of Indiana, Indianapolis, 1885; aged 93; died, April 24.

Charles Cyrus Grant, Rock Hill, S. C.; Trinity Medical College, Toronto, Ont., Canada, 1901; died, April 5.

Andrew Ruppert, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1896; aged 75; died, April 5.

James M. Murphy, Soquel, Calif.; Hospital College of Medicine, Louisville, Ky., 1881; died, April 21.

R. R. Lord, Florence, Ark. (licensed in Arkansas in 1903); aged 83; died, May 6, of cerebral hemorrhage.

Joseph Patrick Savage, Brantford, Ont., Canada (licensed in Ontario in 1925); aged 56; died, April 6.

L. E. Love, Dardanelle, Ark.; Missouri Medical College, St. Louis, 1877; aged 88; died, May 18.

Correspondence

MARITAL ASSOCIATION IN DEATHS FOR CANCER AND OTHER DISEASES

To the Editor:—An editorial (Mortality of Husbands and Wives) in *THE JOURNAL*, March 8, discussing Antonio Ciocco's (*Human Biol.* 12:508 [Dec.] 1940) finding of marital association in deaths from tuberculosis, influenza and pneumonia, heart disease and cancer remarks on the difficulty of explaining such association (except in the case of tuberculosis). It should be pointed out that the observed relationship is possibly linked with increased mortality from these diseases in certain social-occupational groups.

Perhaps the most striking evidence of such selective mortality is found in the reports on occupational mortality in England and Wales. In the latest of these reports (*The Registrar General's Decennial Supplement: England & Wales 1931, Part IIa. Occupational Mortality*, London, His Majesty's Stationery Office, 1938) comparative mortalities are calculated for males by occupation and for married women according to the husband's occupation. Occupations are grouped into five large classes, namely:

- Class I. Professional workers and the like.
- Class II. Intermediate between I and III.
- Class III. Skilled workers.
- Class IV. Intermediate between III and V.
- Class V. Unskilled workers.

It is found that comparative mortalities from certain causes show a progressive increase in each lower class and that this increase obtains both for men and for their wives. The most important of the causes showing such increase are tuberculosis, syphilis, cancer, valvular heart disease, myocardial heart disease, bronchitis, pneumonia and accidents. With the exception of syphilis and accidents, which were not separately considered in Ciocco's study, these are the same causes for which he found a marital association in the data from Washington County, Md.

The higher mortality from valvular heart disease and myocardial disease among unskilled male workers is balanced in part by a decrease in deaths from angina pectoris, but the net mortality for all forms of heart disease in class V remains higher than among all employed males. Among wives of unskilled workers, this excess is even more significant since angina pectoris is a relatively unimportant cause of death among women. It would be of considerable interest to ascertain from Ciocco's records whether the magnitude of the observed marital association of deaths from heart disease is increased when deaths from valvular heart disease and myocardial heart disease are considered separately from other forms.

Cancer mortality in England and Wales likewise shows a progressive increase in each lower social class. A striking observation is that the increase is confined to certain sites of cancer. These sites are, among males, the buccal cavity and pharynx, esophagus, stomach, larynx and skin. Similar class differences for the same sites (except the larynx and the tongue) are observed among married women, who show also increased mortality in the lower socio-economic groups from cancer of the uterus. (On the other hand, married women of the highest economic classes show the highest mortality from cancer of the breast.) It may be possible, therefore, to test, from Ciocco's data, whether the apparent marital association of cancer mortality which he found is another instance of this socio-economic selection by noting whether maritally associated deaths from cancer show a significantly higher proportion of cancers of these sites.

MORTON L. LEVIN, M.D., Albany, N. Y.

Assistant Director, Division of Cancer Control.

SULFATHIAZOLE

To the Editor:—Apropos your comment in *THE JOURNAL* May 17, I should like to add a report given to me by a physician who came in considerably disturbed regarding his lack of attention and inability to concentrate following the administration of sulfathiazole.

He had been suffering from an infection of the olecranon bursa and had been given 12 Gm. of sulfathiazole when the infection occurred. The infection had apparently cleared up considerably, and he decided to visit a very ill patient at the hospital. He had no difficulty in going to the hospital, but on his return from the hospital he noticed that his attention was wandering and that he had difficulty in coordinating his movements.

He was surprised at one school intersection to be stopped by a policeman who, after scolding him in the manner of a policeman, demanded to know whether he was drunk. After he had been recognized and had identified himself, he was told that he was driving on the left side of the street and had not seen the officer's signal for a stop to permit children to cross. He had not noticed that other traffic had to get out of his way so that accidents would be avoided.

After being shocked out of his daze by this incident, he managed to get home, but for one week after he stopped taking sulfathiazole he did not dare to drive his car. He noticed that he was unable to concentrate, unable to diagnose and unable to do complicated actions with his hands for several days after he had stopped taking the drug.

As you state in your comment, it should be brought home to the general physician that these toxic effects do occur and that patients taking this drug should be warned.

MICHAEL E. BRODSKY, M.D., Bridgeport, Conn.

CASE FINDING IN TUBERCULOSIS

To the Editor:—I desire to call attention to a statement on 35 mm. roentgenograms in the timely editorial entitled "Case Finding in Tuberculosis" (*THE JOURNAL*, May 17, p. 2278), which might well be amplified. Only projection is mentioned by the editor as a means of enlarging the fluorographic images for interpretation. Both theoretical physical considerations and practical experience indicate that viewing by transmitted light with suitable magnification is superior to projection. No opaque surface can reproduce the gradation and contrast in the original negative. Convenient viewers with excellent lenses permitting variable magnification are now commercially available, and a stereoscopic viewer is being developed which will permit stereoscopic fluorograms at a film cost of less than 1 cent a patient.

In evaluating the 35 mm. technic, one should realize that methods and materials are still being improved under the stimulus of wide interest. It must be remembered that standard x-ray emulsions, long since developed to a high degree of excellence, are used for 4 by 5 fluorography, whereas up to two years ago no suitable emulsions were available on 35 mm. film. It has been necessary for film companies to develop new emulsions with special sensitivity, gradation and grain size before satisfactory results could be achieved.

Turner and I (*Pub. Health Rep.* 55:2369 [Dec. 27] 1940) have shown that expensive apparatus is not necessary for the production of useful results, and the editor's well put emphasis on roentgenologic "screening" of clinic patients might be extended to encourage the private physician to take fluorograms in his office as part of routine examinations, since the cost is negligible.

W. PALMER DEARING, M.D., Montgomery, Ala.

Passed Assistant Surgeon in Charge,
Memorial Hospital Building.

Medical Examinations and Licensure

COMING EXAMINATIONS

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, July 6, page 63.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, Sept. 10-12. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written. Part I.* Various centers, Nov. 1. Final date for filing application is Aug. 4. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York City.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written.* Nov. 3. Final date for filing application is Sept. 23. *Oral.* Dec. 12-13. Final date for filing application is Nov. 8. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Oct. 20. Final date for filing application is Sept. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written. Part I. Group B.* Jan. 3. *Oral. Part II. Groups A and B.* Atlantic City, May or June. Final date for filing application is 90 days in advance of the examination. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral.* Portland, July 15; Chicago, Oct. 18. *Written.* March 7, 1942. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Washington, January. Final date for filing application is Nov. 1. Sec., Dr. Guy A. Caldwell, 1640 State St., New Orleans, La.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Boston, Oct. 7-8, immediately following the annual meeting of the American Academy of Pediatrics. *Written.* Locally, Aug. 22. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Oral.* New York, Dec. 19-20. Final date for filing application is Oct. 5. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: *Oral. All groups.* Cincinnati, Sept. 19-21. Final date for filing application is Aug. 1. Sec., Dr. Byrl R. Kirklm, 102-110 Second Ave., S. W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written. Part I.* Various centers, Oct. 6. Sec., Dr. J. Stewart Rodman, 225 S. Fifteenth St., Philadelphia.

AMERICAN BOARD OF UROLOGY: Chicago, February. Final date for filing application is three months before date of examination. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Wisconsin January Report

The Wisconsin State Board of Medical Examiners reports the oral, practical and written examination for medical licensure held at Madison, Jan. 14-16, 1941. The examination covered 20 subjects and included 100 questions. An average of 75 per cent was required to pass. Fourteen candidates were examined, all of whom passed. Seventeen physicians were licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Yale University School of Medicine.....	(1934)		88
George Washington University School of Medicine.....	(1939)		84
Loyola University School of Medicine.....	(1938) 83, (1939)		85*
Northwestern University Medical School.....	(1939) 79, (1940)		82
Rush Medical College	(1939)		87
State University of Iowa College of Medicine.....	(1939)		82
University of Louisville School of Medicine.....	(1939)		84
Washington University School of Medicine.....	(1937)		82
Marquette University School of Medicine.....	(1940) 83, 84, 85		85
University of Wisconsin Medical School.....	(1937)		84

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of California Medical School.....	(1937)		Arizona
Loyola University School of Medicine.....	(1925), (1933)		Illinois
Northwestern University Medical School.....	(1940)		Illinois
University of Illinois College of Medicine.....	(1939)		Illinois
University of Kansas School of Medicine.....	(1934), (1935)		Kansas
University of Louisville School of Medicine.....	(1935)		Kentucky
Tulane University of Louisiana School of Medicine.....	(1920)		Louisiana
Harvard Medical School.....	(1935)		Minnesota
University of Minnesota Medical School.....	(1934)		New York,
(1937) Minnesota			
University of Nebraska College of Medicine.....	(1934)		Nebraska
Vanderbilt University School of Medicine.....	(1938)		Kentucky
University of Wisconsin Medical School.....	(1938)		Kansas
University of Toronto Faculty of Medicine.....	(1928)		New York
McGill University Faculty of Medicine.....	(1921)		Ohio

* This applicant has completed four years' medical work and will receive the M.D. degree on completion of internship.

South Dakota January Report

The South Dakota State Board of Medical Examiners reports the written examination for medical licensure held at Pierre, Jan. 21-22, 1941. The examination covered 13 subjects and included 95 questions. An average of 75 per cent was required to pass. Three candidates were examined, all of whom passed. Two physicians were licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Rush Medical College.....	(1914)		82.3
Washington University School of Medicine.....	(1938)		83.7
University of Toronto Faculty of Medicine.....	(1938)		90

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Minnesota Medical School.....	(1923)		Minnesota
McGill University Faculty of Medicine.....	(1932)		N. Dakota

Ohio Reciprocity Report

The Ohio State Medical Board reports 21 physicians licensed to practice medicine by reciprocity and 5 physicians so licensed by endorsement of credentials of the National Board of Medical Examiners on January 7. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists.....	(1931)		S. Dakota
Stanford University School of Medicine.....	(1938)		California
Northwestern University Medical School.....	(1937), (1938)		Illinois
Rush Medical College.....	(1915), (1936)		Illinois
The School of Medicine of the Division of the Biological Sciences	(1936)		Illinois
University of Illinois College of Medicine.....	(1939)		Illinois
Indiana University School of Medicine.....	(1929)		Indiana
State University of Iowa College of Medicine.....	(1936), (1938)		Iowa
University of Kansas School of Medicine.....	(1920)		Kansas
University of Louisville School of Medicine.....	(1934)		Kentucky
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1940)		Maryland
Barnes Medical College.....	(1900)		Missouri
St. Louis University School of Medicine.....	(1940)		Missouri
University of Nebraska College of Medicine.....	(1920)		Nebraska
Duke University School of Medicine.....	(1934)		Iowa
University of Vermont College of Medicine.....	(1921)		Vermont
University of Virginia Department of Medicine.....	(1935)		Virginia
Marquette University School of Medicine.....	(1939)		Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad.
College of Medical Evangelists.....	(1936)	
Georgetown University	(1936)	
Boston University School of Medicine.....	(1932)	
Duke University School of Medicine.....	(1938)	
Creighton University School of Medicine.....	(1938)	

North Dakota January Report

The North Dakota State Board of Medical Examiners reports the written examination for medical licensure held at Grand Forks, Jan. 7-10, 1941. The examination covered 13 subjects and included 100 questions. An average of 75 per cent was required to pass. Seven candidates were examined, 6 of whom passed and 1 failed. Six physicians were licensed to practice medicine by reciprocity and 1 physician so licensed by endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Northwestern University Medical School.....	(1939)		82
Rush Medical College.....	(1938)		77.3, 81
University of Minnesota Medical School.....	(1935) 81.7, (1940)		77.5
University of Manitoba Faculty of Medicine.....	(1937)		78.3

School	FAILED	Year Grad.
University of Minnesota Medical School.....	(1929)	

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Rush Medical College.....	(1933)		S. Dakota
University of Minnesota Medical School.....	(1939)		Michigan
University of Nebraska College of Medicine.....	(1919)		Wyoming
Ohio State University College of Medicine.....	(1938)		Ohio
Jefferson Medical College of Philadelphia.....	(1930)		Penna.
Medical College of Virginia.....	(1936)		Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad.
Rush Medical College.....	(1939)	

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Hospital and Surgical Expenses Incurred Following Erroneous Diagnosis Not Recoverable from Diagnostician and His Employers.—Mrs. Bugg entered a hospital owned and operated by the defendant hospital association and was placed under the care of Dr. Schoch, a salaried member of the hospital staff, for the diagnosis and treatment, as was alleged in the lawsuit that followed, of a small lump or growth in her left breast. The following day, the physician made an incision in the breast near the lump, although, as was alleged in the lawsuit, "not in or upon it," and took therefrom a piece of tissue. Six days later the patient left the hospital and about ten days later received a letter from the physician, stating "my microscope tells me the breast should be removed." Later, in response to a telegram, Schoch stated that the tissue was cancerous. The patient went immediately to a clinic in another state and, as was alleged in the subsequent lawsuit,

informed the head of the Clinic Department of Surgery of the history of the case, including the diagnosis made by the defendants, and, on the strength of the said diagnosis, was immediately operated upon by the said surgeon. Her left breast was entirely removed as well as the lymph glands under her left arm, without further diagnosis. The growth was not a malignant one. . . . [the patient] had no cancer, and the diagnosis of the defendant was an incorrect one.

Later the plaintiff, Mrs. Bugg's husband, brought an action against the hospital association, an insurance company of which the hospital association was "an agent and instrumentality," and Schoch to recover money, which he alleged he was required to expend because of the wrongful and negligent diagnosis and treatment by the corporate defendants and Schoch. The trial court overruled demurrers each defendant interposed to the petition and the defendants appealed to the Supreme Court of Kansas.

The principal question involved on the appeal was whether or not the alleged wrongful diagnosis was the proximate cause of the expenses incurred subsequently. Generally, said the court, a physician or surgeon is not liable for an honest error or mistake in diagnosis without treatment. The petition in this case pleads no treatment unless the procedure incident to the making of the diagnosis alone constitutes treatment, and we know of no authorities that hold such practice to constitute treatment in any proper sense of the term. The services of the defendant physician ended with diagnosis. Whatever plaintiff's wife did thereafter constituted a voluntary act of her own and must be held to have been performed solely on her own initiative. The diagnosis was not the proximate cause of the damages sought to be recovered.

The court did not agree with a contention of the defendants that if liability attaches to any one under the facts here present it should attach to the clinic for negligence in operating without first making its own independent diagnosis. In any event, said the court, the defendants urged that the proximate cause of the damage was the intervention of an independent and intelligent third party, namely, the clinic which performed the operation. For the purpose of this lawsuit it will suffice to say that in our opinion the wrongful diagnosis was not the proximate cause of the damage claimed. Since, under the averments of the petition, the defendant physician was not liable, it, of course, follows that the defendant corporations, the insurance association and the hospital association, are not liable. The court accordingly remanded the cause to the trial court with directions to sustain the demurrers.

In a dissenting opinion, however, Wedell, Justice, believed that the action of the trial court in overruling the demurrers was proper. Matters alleged in the petition, this justice said, are admitted as true by the demurrer. It is elementary that a physician or surgeon ordinarily is not liable in damages for an honest error or mistake in judgment. That fact, however, does

not relieve him from the duty of exercising reasonable care and skill in making a diagnosis which must form the basis of his judgment. The demurrer admitted, in effect, that the patient did not have cancer, that the diagnosis was negligently and carelessly made, that the physician did merely more than make a diagnosis, that he advised his patient that she should have her breast removed, and that in obedience to his advice she had the breast removed when the tissue in fact was not cancerous. Some of the items of expense for which recovery is sought are expenses incurred in following the physician's advice. The dissenting justice could not say as a matter of law that the physician's diagnosis combined with his advice was not the proximate or legal cause of some expenses incurred. The demurrer also admitted that it was imperative that the operation be performed by the clinic at once and without the delay which would be occasioned by the clinic's independent diagnosis. In the justice's view, it was immaterial whether or not the clinic was also negligent because it operated without confirming the diagnosis. Even if the clinic was negligent also in the matter that fact would not relieve the defendants from liability.

However, as stated before, the cause was remanded to the trial court with directions to sustain the demurrers interposed. —*Bugg v. Security Ben. Ass'n et al.*, 112 P. (2d) 73 (Kan., 1941).

Malpractice: Liability of Chiropractor for Negligent Treatment of Fracture.—The patient sustained a "slight fracture" of her wrist and engaged the defendant chiropractor to treat it. Contending that he negligently and unskillfully applied a first cast and subsequently a second cast so tightly as to interfere with the circulation, and that the casts were permitted to remain on the arm over a long period of time, during which diathermy treatments were administered so frequently and with such intensity as to damage the tissues, tendons and bones of the arm, wrist and hand, the patient and her husband sued the chiropractor for damages. From a judgment for the plaintiffs, the defendant appealed to the district court of appeal, first district, division 2, California.

The defendant contended that the evidence was insufficient to support the judgment, but the court of appeal could find no merit in the contention. Both lay and expert witnesses testified for the plaintiffs. The expert witnesses were physicians and surgeons, and the defendant apparently conceded that their testimony was competent against him for the purposes for which it was produced. In the opinion of the court there was substantial evidence to sustain all the material findings. The evidence on many points was admittedly conflicting and the defendant contended that "no finding of the trial court should be sustained . . . unless such finding is supported by a preponderance of the evidence in relation thereto." It was a sufficient answer to this contention, the court said, to state that in California, where a trial court has made findings which are supported by substantial evidence, an appellate court may not disturb the findings even if it should believe from the record before it that the preponderance of the evidence was to the contrary. The judgment for the plaintiffs was therefore affirmed. —*Wallace et al. v. La Vine*, 97 P. (2d) 879 (Calif., 1940).

Society Proceedings

COMING MEETINGS

- American Congress of Physical Therapy, Washington, D. C., Sept. 1-5.
- Dr. Richard Kovacs, 2 East 88th St., New York, Secretary.
- American Physiotherapy Association, Asilomar, Calif., July 13-18. Miss Evelyn Anderson, Stanford University, Calif., Secretary.
- National Medical Association, Chicago, Aug. 18-22. Dr. John T. Givens, 1108 Church St., Norfolk, Va., General Secretary.
- Oregon State Medical Society, Portland, Sept. 3-6. Dr. M. L. Bridgeman, 1020 S. W. Taylor St., Portland, Secretary.
- Rocky Mountain Medical Conference, Yellowstone Park, Wyo., Sept. 2-4.
- Mr. W. H. Tibbals, 610 McIntyre Bldg., Salt Lake City, Secretary.
- Washington State Medical Association, Seattle, Aug. 24-26. Dr. Vernon W. Spickard, 1305 Fourth Ave., Seattle, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery 10:325-352 (April) 1941

- Anemia. R. B. Dodson, Cullman.—p. 325.
Pregnancy and Cancer of Cervix Uteri: Report of Case. M. E. Smith, Parrish.—p. 329.
Further Study of Stilbestrol in Uterine Bleeding. G. F. Douglas and H. M. Imerman, Birmingham.—p. 332.
Sinusitis. E. R. Nodine, Andalusia.—p. 336.
Primary Lymphosarcoma of Thymus Gland. C. R. Lafferty, Montgomery.—p. 338.
Recognition and Bronchoscopic Treatment of Pulmonary Atelectasis: Report of Nine Cases. G. E. Fisher, Birmingham.—p. 340.
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Section D

- Further Observations on Immunity Induced in Dogs by Repeated Infections with Hookworm, *Ancylostoma Caninum*. G. F. Otto, Baltimore.—p. 39.

Imperfect Sterilization and Epidemic Diarrhea.—Lembecke discusses two epidemics of diarrhea of the newborn which occurred in a hospital in Rochester, N. Y., and which seemed to be separate clinical entities. The first group consisted of 44 cases with no deaths. Approximately two thirds of these cases occurred between the first of the year and March 15. The second group of cases began to become numerous after March 15, and by July 21 there was a total of 105 cases with 5 deaths. The first epidemic was characterized by very little toxicity, blood or mucus in the stools. This outbreak subsided spontaneously. The second epidemic was characterized by dehydration, toxicity and loose, frequent stools without blood or mucus. The etiologic agent and mode of transmission could not be determined for either outbreak. Examination of numerous fecal specimens obtained from cases in the second outbreak did not reveal any of the usual enteric pathogens. Contaminated nursing nipples and food formula may have been factors in transmitting the infection. The second epidemic was controlled by segregating all patients in a separately staffed and

equipped nursery, plus proper sterilization of nipples and formula. Bacteriologic examination of nipples and food as prepared in the nurseries of several hospitals showed that satisfactorily low bacteria counts are often not obtained by the methods and technics commonly employed. Such routine procedures should be considered satisfactory only after they have been proved effective by laboratory examinations. Regular bacteriologic examinations, similar to those followed in supervision of milk and water supplies, would seem desirable to learn whether effective methods are being maintained in hospital nurseries.

American Journal of Medical Sciences, Philadelphia 201:469-628 (April) 1941

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*Infectious Mononucleosis: Diagnostic Problem. S. J. Werlin, Vera B. Dolgopel and M. E. Stern, New York.—p. 474.
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Urinary Excretion of Bisulfite Binding Substances by Human Adults on Thiamine-Low Diets. M. E. Shils, H. G. Day and E. V. McCollum, Baltimore.—p. 561.
Relationship Between Specific Gravity and Protein Content in Human Serous Effusions. F. K. Paddock, Boston.—p. 569.
Immune Response in Drug Treated Cases of Pneumococcal Pneumonia. L. L. Terry, L. D. Thompson and J. C. Edwards, St. Louis.—p. 574.
*Sulfadiazine and Sulfathiazole in Treatment of Pneumococcal Pneumonia: Progress Report on 200 Cases. H. F. Flippin, S. B. Rose, L. Schwartz and A. H. Domini, with technical assistance of Beatrice Doak, Philadelphia.—p. 585.

Diagnosis of Hemophilia.—Quick offers a test which is a modification of the determination of the clotting time of recalcified plasma. Earlier investigators have found that the clotting time of recalcified plasma was prolonged in hemophilia. The author's investigations led to the finding that in hemophilic plasma the speed of centrifugating definitely influenced the subsequent coagulation time. The test is performed as follows: by venipuncture 4.5 cc. of blood is drawn and mixed immediately with 0.5 cc. of tenth molar sodium oxalate. The blood is divided into two equal portions. One half is centrifugated for five minutes at a rate of not more than 1,000 revolutions a minute, while the other half is subjected to centrifugation of 3,000 revolutions a minute in an Angle centrifuge. The clotting time of each specimen is tested in a small test tube in which 0.1 cc. of plasma is mixed with 0.2 cc. of 0.0125 molar calcium chloride. The tube is placed in a water bath kept at 37.5 C. and tilted occasionally. The exact time required for the formation of a solid clot is recorded. For the sodium oxalate tenth molar solution 1.34 Gm. of sodium oxalate is dissolved in 100 cc. of distilled water and for the calcium chloride 0.0125 molar solution 0.14 Gm. of anhydrous calcium chloride and 0.42 Gm. of sodium chloride are dissolved in 100 cc. of distilled water. The author offers an outline for the differential diagnosis of hemophilia from other hemorrhagic diseases based on the facts that in hemophilia the coagulation time of the blood and of the recalcified oxalated plasma is prolonged but that clot retraction, bleeding time, prothrombin concentration and the tourniquet test are normal.

Infectious Mononucleosis.—Werlin and his associates point out that the practitioner is not always aware of the relatively frequent occurrence or of the severe clinical picture with which infectious mononucleosis may manifest itself. Consequently cases are often diagnosed as other infectious diseases or as common acute infections of the oral cavity. The severe

pharyngitis in infectious mononucleosis is the usual source of error, as it often simulates diphtheria. The diagnostic difficulties are illustrated by the 21 cases referred to the Willard Parker Hospital with mistaken diagnoses during the years 1937 through 1939. The diagnoses were diphtheria, epidemic parotitis (mumps), follicular tonsillitis, streptococcal pharyngitis and acute sinusitis. The duration of illness prior to admission varied from one to twenty-two days, hospitalization from six to twenty-four days, and the total days of illness from ten to twenty-eight. The complaints on admission were, in order of their frequency, pharyngitis, malaise, anorexia, headache, dysphagia, vomiting, facial edema, lacrimation, chills, nasal discharge and dysarthria. The temperature on admission ranged from 99 to 104 F. and its duration from the onset of illness from seven to seventeen days. The pulse was elevated in relation to the temperature. The physical manifestations were tonsillitis, lymphadenitis, palpable spleen and liver, edema of the face and dacryocystitis. Tonsillitis was the most constant finding. On admission all patients with one exception presented a membrane or an exudate on one or both tonsils. In 18 tonsillitis was severe. The cervical, axillary and inguinal lymph nodes of 9 patients were enlarged; in 2 the popliteal lymph nodes were also enlarged. The spleen was palpable in 7 and the liver in 3. Edema of the face was observed in 2 patients. Dacryocystitis developed in 1 patient on the ninth day of illness, and 1 patient presented secondary anemia on the eleventh day. He received no drugs. The diagnosis of infectious mononucleosis should not be difficult if the disease is kept in mind. The clinical picture may not always be typical but a hematologic study over several days and a positive heterophil antibody reaction help to confirm the diagnosis. As infectious mononucleosis is primarily a pharyngeal infection, the differential diagnosis must include diphtheria, acute tonsillitis, ulcerative sore throat, streptococcal and staphylococcal pharyngitis, agranulocytic angina and acute lymphatic leukemia with pharyngitis. In the early stages, when only the cervical lymph nodes may be enlarged, the question of mumps may arise. The enlarged cervical lymph nodes may simulate enlargement of the parotid glands. Early differentiation from diphtheria is especially desirable so that antitoxin will not be administered and the patient sensitized to the horse serum.

Sulfadiazine and Sulfathiazole for Pneumococcal Pneumonia.—Flippin and his collaborators compare the therapeutic effectiveness and toxicity of sulfadiazine and sulfathiazole in the treatment of pneumonia. From November 1940 the medical services were divided into two therapeutic groups. The first 173 cases in which pneumonia was typed (87 sulfadiazine, 86 sulfathiazole) and the first 27 in which pneumonia was not typed (13 sulfadiazine and 14 sulfathiazole) are considered. Determinations of free and total amount of the drug in the blood were made on all patients receiving sulfadiazine or sulfathiazole. Special studies were made on daily samples of urine for crystals of both drugs. An initial dose of 3 Gm. of sulfadiazine was given by mouth followed by 1 Gm. every four hours, unless signs of severe toxicity developed. Treatment was continued until the temperature was normal for forty-eight hours and there was evidence of clinical improvement. The dose for sulfathiazole was the same except that the 3 Gm. dose was repeated in four hours. The total dose was from 25 to 35 Gm. The average total dose for sulfadiazine was 27 Gm. and for sulfathiazole 29.9 Gm. Type-specific serum was considered necessary for 18 patients (11 treated with sulfadiazine and 7 with sulfathiazole). There were 11 deaths among the patients treated with sulfadiazine; 5 of them were hospitalized for less than twenty-four hours (corrected mortality for 95 patients, 6.3 per cent). There were 17 deaths among those treated with sulfathiazole; since 8 were hospitalized for less than twenty-four hours this gives a corrected mortality of 11.5 per cent. Sulfadiazine tended to lower the temperature somewhat sooner than did sulfathiazole. The toxic manifestations were low in the two therapeutic groups. The relatively low incidence of vomiting in both groups was impressive, especially when compared with the incidence in groups given sulfapyridine. Microscopic hematuria was encountered more often in patients receiving sulfathiazole and this, the authors believe, was related chiefly to the more pronounced acetylation of the sulfathiazole

molecule and the poorer solubility of acetylsulfathiazole in urine as compared with acetylsulfadiazine. These two facts might readily account for a lessened irritation of the urinary tract by sulfadiazine and a consequent lowered incidence of microscopic hematuria. This impression is supported by the presence of fewer crystals in the urine of sulfadiazine treated patients.

American Journal of Surgery, New York

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- Diagnosis and Treatment of Acute Diseases of Abdomen in Children. M. T. Hoerner, Dayton, Ohio.—p. 3.
- *Local and General Temperature Reduction in Malignancy. A. J. Jones, J. Graham and A. Mueller, Springfield, Ill.—p. 14.
- Peridural Anesthesia: Consideration of 1,000 Cases. J. R. Harger, E. A. Christofferson and A. J. Stokes, Chicago.—p. 24.
- Modified Porro Operation. I. W. Potter and M. G. Potter, Buffalo.—p. 32.
- Umbilical Hernia. C. M. O'Leary and C. E. Clymer, Oklahoma City.—p. 38.
- Follow-Up of Hernia Repair in Mentally Sick and Mentally Deficient Patients. C. Bell, E. V. Semrad and W. Corwin, Waltham, Mass.—p. 44.
- Lymphosarcoma: Report of Three Apparently Cured Cases. E. R. Pund and F. H. Stelling, Augusta, Ga.—p. 50.
- Use of Iliac Bone in Facial and Cranial Repair. J. E. Sheehan, New York.—p. 55.
- Rebuilding the Alveolar Process and the Buccal Sulcus. A. G. Bettman, Portland, Ore.—p. 62.
- Experimental Studies on Solvent Action of Ether on Gallstones. A. B. Raffi, Syracuse, N. Y.—p. 65.
- Atlanto-Axial Dislocation: Reduction by Skeletal Traction: Report of Case. D. H. Echols and L. R. J. Kleinsasser, New Orleans.—p. 70.
- Partial Amputation of Penis: Modification of Standard Technique for Ventral Growth. J. Ingham, Easton, Pa.—p. 74.
- Complete Dislocation of Knee Joint: Report of Six Cases with End Results. M. J. Wilson, A. A. Michele and E. W. Jacobson, New York.—p. 77.
- *Lingual Thyroid. W. T. Lemmon and G. W. Paschal Jr., Philadelphia.—p. 82.
- Modification of Munro Tidal Drainage Apparatus. J. A. Hyams, New York, and H. Buchtel, Denver.—p. 86.
- Oxyuris Vermicularis Appendicitis: Incidence of Oxyuris Vermicularis in Series of 1,016 Cases of Appendicitis. W. V. Wax, Catskill, N. Y., and N. S. Cooper, Athens, N. Y.—p. 89.
- *Placenta Accreta: Report of Three Cases. J. I. Kushner, New York.—p. 92.

Hypothermia for Cancer.—Jones and his associates subjected 14 patients with inoperable and far advanced cancers to local and general hypothermia, not lower than 77.6 F. The periods of general hypothermia varied from thirty-six and one-half to one hundred and twenty hours. The periods of local reduction ranged from two hundred and thirty-six to seven hundred and ninety-two hours. Twelve patients were submitted to hibernation; 1 died during hibernation apparently because of cerebral edema superimposed on meningeal metastases, 8 died from three to seven and one-half months after hibernation, and 3 patients are living three and one-half, four and one-half and eight months, respectively, after hibernation. The 2 patients who were treated only locally died, respectively, within one and nine months. All patients complaining of pain were relieved in whole or in part following local or general hypothermia.

Lingual Thyroid.—Lemmon and Paschal report a case of lingual thyroid. They point out that in the process of fetal development the thyroid develops from a median diverticulum which appears about the fourth week on the summit of the tuberculum impar and is later found behind the tuberculum. It grows downward and backward as a tubular duct which bifurcates and subsequently divides into a series of cellular cords from which its isthmus and lateral lobes are developed. With faulty descent from its site of origin it may come to be situated in whole or in part anywhere along the course of the duct. When this occurs at the foramen cecum a lingual thyroid results. If portions of it are arrested in its descent in the substance of the tongue an intralingual thyroid results or, if at its base, a sublingual thyroid is formed. A prelaryngeal thyroid is seen when this process takes place in front of the larynx below the hyoid bone. The gland is next found on the way down in its normal situation. There may be additional masses of thyroid tissue in the retrosternal area as a result of the downward projection of cells. A lingual thyroid exists from birth. The greater percentage of the reported cases (about 250) occurred in females and were brought to the patient's attention by physiologic enlargement at puberty and in some cases during pregnancy. Some women noted enlargement during menstruation and also following operations for ovarian

cysts. Following thyroidectomy there has been a compensatory enlargement of the accessory lingual thyroid. It may be accidentally discovered in younger patients if the gland on the tongue is small. It may increase in size so as to interfere with swallowing and impair nutrition. Dyspnea may be the chief complaint, or there may be a disturbance in phonation. Generally a lingual thyroid is a single tumor covered by the mucosa of the tongue, with a smooth or lobulated surface and somewhat globular. It usually has a broad base. Instances have been reported in which it has been found at the end of a pedicle. In 70 per cent of these cases the thyroid in the neck has been reported absent, a fact which must be considered before surgical treatment is instituted. The lingual thyroid may show any of the changes seen in a normally situated thyroid: cysts, adenomas or malignant changes. Toxic symptoms from hyperactivity occur and cretinism and myxedema have been observed. However these conditions are infrequent. There may be no associated symptoms, particularly if the growth is small. If the growth is larger, it is so located as to be traumatized frequently during deglutition and give rise to hemorrhage. Bronson states that this occurred in 10 per cent of the reported cases. The patients complain of a fullness in the throat, difficulty in swallowing, breathing and talking. Ulceration and occasionally pain may follow trauma, and the breath may have a fetid, offensive odor. The existence of other thyroid tissue should be confirmed before a lingual thyroid is removed. Extirpation is justified when the enlargement is sufficient to interfere with breathing, speaking or swallowing, when hemorrhage, degeneration, necrosis and hyperthyroidism do not yield to medical treatment and when a malignant change is suspected. In the absence of other thyroid tissue subtotal removal of the lingual gland has been done and the incidence of recurrence has been small. However if the entire gland is removed the patient's needs can be met by the administration of thyroid, the dosage being determined by periodic basal metabolic rates. This should be done before operation and at regular intervals thereafter. Attempts to transplant some thyroid tissue have not been successful. It is difficult to remove tissue from such an infective area as the mouth and obtain a successful graft.

Placenta Accreta.—Kushner states that placenta accreta is due to a complete or partial absence of the decidua basalis, especially of its deep or spongy layer which results from the compression of the mucosal glands. Normally there is a cleavage of this spongy layer. Absence of the decidua basalis forces the chorionic villi to attach themselves to the myometrium. He reports 3 cases observed between July 1932 and March 1938, during which time there were 10,000 deliveries. This gives an incidence of 1 in every 3,333 deliveries.

Archives of Neurology and Psychiatry, Chicago

45:577-732 (April) 1941

- Neurologic Syndromes Accompanying Developmental Anomalies of Occipital Bone, Atlas and Axis. C. F. List, Ann Arbor, Mich.—p. 577.
- Convulsive Phenomena Produced by New Method of Remote Excitation. F. A. Fender, San Francisco.—p. 617.
- *Prolonged Jugular Compression: Diagnostic Test of Neurologic Value. R. B. Aird, San Francisco.—p. 633.
- Clinical Trial of Beta Erythroidine Hydrochloride in Hypertonic and in Hyperkinetic States. V. W. Eisenstein, Pittsburgh, and M. Tarlau, New York.—p. 649.
- Polioencephalitis Haemorrhagica of Wernicke Associated with Febrile Disease: Report of Two Cases, One Occurring During Typhoid Fever and Verified by Autopsy. Y. C. Chang, T. H. Suh and C. C. Ling, Shanghai, China.—p. 658.
- *Corticomeningeal Scars in Traumatic Epilepsy: Localization by Pneumographic Examination of Subdural Space. H. Olivecrona, Stockholm, Sweden.—p. 666.
- Vitamin Therapy of Diseases of Neuromuscular Apparatus. A. M. Doyle, Kingston, Ont., Canada, and H. H. Merritt, Boston.—p. 672.
- Neuritis Associated with Acromegaly. H. W. Woltman, Rochester, Minn.—p. 680.
- Presenile Disease of Central Nervous System: Report of Unusual Case. W. H. McMenemy, Oxford, England, and E. Pollak, Vienna, Austria.—p. 683.

Prolonged Jugular Compression.—Aird found that jugular compression by means of a pressure cuff about the neck, as suggested by Grant and Cone, either exaggerated signs or symptoms already present or brought about some new manifestation in a number of the 100 patients with various neurologic disorders on whom the test was tried. Positive results were

obtained in a high percentage of patients with proved tumors of the brain and spinal cord. Positive results were obtained in 41 of 45 cases of proved space-consuming lesions, while negative responses were obtained in all of the 54 cases in which such lesions were not present. A high percentage of positive responses also occurred in cases of proved herniation of the intervertebral disk. Cases in which a tumor was later ruled out invariably gave negative results, as did cases of degenerative disease of the central nervous system, convulsions of unknown origin and post-traumatic syndromes in the head. Prolonged jugular compression appears to be of considerable value in differential diagnosis of space-consuming lesions of the central nervous system and herniations of the intervertebral disk. It is valuable in corroborating the more obvious diagnoses and it contributes new data in cases of obscure involvement. Although the dangers of prolonged jugular compression appear negligible, the author warns that the test should be used with caution when tumors of the brain stem or posterior fossa are suspected. Occasionally patients with such tumors are known to die suddenly or during periods of physical effort and strain.

Corticomeningeal Scars in Traumatic Epilepsy.—It occurred to Olivecrona that the procedure recommended by Penfield and Norcross (introduction of air into the subdural space for the relief of post-traumatic headache) might be used to demonstrate the presence and location of adhesions when there is a scar in the underlying cortex. Through a small burr hole a nick is made in the dura while the cerebrospinal fluid is drained off through a lumbar puncture. As the subarachnoid space collapses the subdural space becomes filled with air, which may be sufficient to break filmy adhesions between the pia arachnoid and the dura and to relieve pain due to their pull. The author cites an instance of an epileptic syndrome in a woman aged 23 which could be traced to an injury to the head received in early childhood and trivial at the time. Pneumograms of the subdural space demonstrated a circumscribed lesion in the left frontal lobe and since the scar has been removed the patient has now been well for one and one-half years. The patient was always thought to suffer from so-called idiopathic epilepsy. This illustrates the importance of a careful search in the history of every epileptic patient for trauma, including birth injuries.

Arkansas Medical Society Journal, Fort Smith

37:229-254 (April) 1941

- Advantages of Serum and Plasma Transfusions Over Other Intravenous Medicaments. J. H. Connell, Pineville, La.—p. 229.
- Appendicitis. E. M. Miers, Mena.—p. 231.

Bulletin Johns Hopkins Hospital, Baltimore

68:291-352 (April) 1941

- Clinical Observations on Pupillary Phenomena Resulting from Regeneration of Third Nerve, with Especial Reference to Argyll Robertson Pupil. F. R. Ford, F. B. Walsh and A. King, Baltimore.—p. 309.
- Nephrocalcinosis and Hypertension Following Hyperparathyroidism; Terminal Dissecting Aneurysm. S. Mayer Jr., Baltimore.—p. 319.
- Effects of Glucose and of Insulin on Metabolism of Isolated Diaphragm of Rat. C. L. Gemmill, Baltimore.—p. 329.
- Unusual Ureteral Extension of Prostatic Carcinoma. W. H. Higgins 3d, Baltimore.—p. 337.

Bulletin New York Academy of Medicine, New York

17:243-324 (April) 1941

- Virus Infections. T. M. Rivers, New York.—p. 245.
- Polioomyelitis. J. R. Paul, New Haven, Conn.—p. 259.
- Epidemic Influenza. T. Francis Jr., New York.—p. 268.
- Rickettsial Diseases, with Special Reference to Those of Importance Along the Atlantic Seaboard. G. Blumer, New Haven, Conn.—p. 280.
- Studies on Choriomeningitis and Poliomyelitis. C. Armstrong, Washington, D. C.—p. 295.

California and Western Medicine, San Francisco

54:153-252 (April) 1941

- Some Factors Involved in Care of Patient Seriously Ill with Biliary Tract Disease. I. S. Ravdin, Philadelphia.—p. 212.
- Analysis of Causes of Death in Prostatectomy. J. A. Dougherty, Oakland.—p. 216.
- Relationship of Radiology to Physical World and to Society. R. R. Newell, San Francisco.—p. 218.
- Development and Clinical Use of Vitamin K. G. Cheney, San Francisco.—p. 224.

Canadian Public Health Journal, Toronto

32:95-142 (March) 1941

- Rheumatic Heart Disease: Public Health Problem. J. D. Keith, Toronto.—p. 95.
- *Administration of Toxoid and Results of Schick Testing in Glace Bay, Nova Scotia, 1938-1939. C. J. W. Beckwith, Sydney, N. S.—p. 103.
- New Phage and Susceptible W Form of Salmonella Typhi Isolated from Typhoid Fever Case. C. E. Dolman, Donna E. Kerr and Dorothy E. Helmer, Vancouver, B. C.—p. 113.
- Typing of Meningococci: Preliminary Report on Survival of Group I (Types I-III) and Type II Strains of Meningococci in Blood of Normal Guinea Pigs. N. Silverthorne, with technical assistance of C. Cameron, Toronto.—p. 120.
- Application of Evelyn Photoelectric Colorimeter to Modification of Kay and Graham's Phosphatase Test. J. Wylie, Kingston, Ont.—p. 122.

Administration of Toxoid and Results of Schick Testing.—Beckwith reports the results of mass immunization against diphtheria in Cape Breton County. Statistics for the ten years from 1929 through 1938 show a total of 77 deaths from this disease in a population of 92,000. During the years 1930 to 1938, 485 cases were reported. That the reporting was not complete is indicated by the fact that 26 deaths were recorded in communities from which no cases were reported. During 1938 a total of 10,994 preschool and school children started the series of three toxoid inoculations and 9,669 (88 per cent) completed them. At the end of the third fiscal year (Nov. 30, 1940) a minimum of 17,186 children had received three doses of plain toxoid at the toxoid clinics; considerable immunization is done by private physicians. This toxoid program, together with a close watch for diphtheria carriers among contacts and cases, reveals the following: In 1938 there were 127 cases reported with 13 deaths, and for 1939 and 1940 the respective figures are 35 and 6, and 16 and 0. Of the 16 cases reported in 1940, 5 occurred in one family. In none of these was toxoid administered. The author concludes that: 1. For mass immunization the administration of plain diphtheria toxoid in three doses at intervals of three weeks is a safe procedure. 2. An effort should be made to see that children of preschool age receive the three required doses. 3. Of the 5,799 children who received one to three doses of toxoid, the Schick test was performed on 4,546, or 78.6 per cent. In addition, 799 children who had not received any toxoid were tested. 4. That the three doses of plain diphtheria toxoid produce immunity is evidenced by negative Schick reactions ranging from 18.8 per cent in those having had no toxoid to 89 per cent in those given three doses of toxoid. 5. Despite an increasing immunity noted with one, two and three doses of plain toxoid, only three doses can be relied on. 6. While no serious reactions were encountered in the 5,799 children up to 20 years of age who received toxoid, it is probably advisable to test children more than 12 years of age for sensitivity before administering toxoid. All adults must be Schick tested before toxoid is administered to determine the presence or absence of immunity and to determine whether they are sensitive to diphtheria protein. If the individual is susceptible to diphtheria a special preparation of dilute toxoid is available for immunization. 7. A community cannot be considered as secure against an outbreak of diphtheria if the child population, especially those of the preschool age group, has not been given three immunizing doses of toxoid. Such a procedure will develop a high level of immunity in the population, and an epidemic of diphtheria need not be feared. 8. The preschool group bears the brunt of an epidemic of any of the common communicable diseases, and diphtheria is no exception.

Florida Medical Association Journal, Jacksonville

27:477-532 (April) 1941

- Absorption of Quinine into Cerebrospinal Fluid of Fetus in Utero. H. M. Taylor, L. Y. Dyrenforth, Jacksonville, and C. B. Pollard, Gainesville.—p. 487.
- Herniation of Intervertebral Disk. J. G. Lyerly, Jacksonville.—p. 491.
- Branchial Cleft Fistulas: Report of Two Cases. F. H. Bowen, Jacksonville.—p. 500.
- Peptic Ulcers Associated with Pituitary Tumors. A. J. Graves, Jacksonville, and P. J. Hodcs, Philadelphia.—p. 503.

Illinois Medical Journal, Chicago

79:265-356 (April) 1941

- Surgical Treatment of Leg Length Discrepancies. P. H. Harmon, Chicago, and W. M. Krigsten, Sioux City, Iowa.—p. 300.
- Clinical Application of Sulfanilamide, Sulfapyridine and Sulfathiazole. B. C. Corbus Jr., Chicago.—p. 307.
- X-Ray Therapy in Pneumonia. F. Decker, Peoria.—p. 313.
- Cholecystectomy. R. B. Bettman, Chicago.—p. 320.
- Cesarean Section: Study of 340 Cases. W. C. Danforth and E. S. Burge, Evanston.—p. 326.
- Results of Surgical Treatment of Tuberculosis of Joints. C. N. Lambert and L. F. Miller, Chicago.—p. 330.
- Etiology of Stammering: Examination into Certain Recent Studies, with a Glance into the Future. E. L. Kenyon, Chicago.—p. 334.
- Paralytic Accidents Due to Rabies Vaccine. L. W. Mason and R. S. Dille, Evanston.—p. 341.
- Contribution of the Laboratory to Treatment of Hemorrhage. A. J. Quick, Milwaukee.—p. 346.
- Value of Routine Serologic Tests for Syphilis. V. Levine, Chicago.—p. 349.

Iowa State Medical Society Journal, Des Moines

31:135-180 (April) 1941

- Taking and Preserving Blood Specimens for Alcohol Analysis. T. U. Marron, Des Moines.—p. 146.
- Obstetric Anesthesia in the Home. Pauline V. Moore, Iowa City.—p. 149.
- Congenital Deformities: Report of Case. E. J. Steenrod, Iowa Falls.—p. 150.

Journal of Lab. and Clinical Medicine, St. Louis

26:1079-1238 (April) 1941

- Diagnostic Value of Takata-Ara Reaction in Cerebrospinal Fluid. P. B. Szanto and S. Burack, Kankakee, Ill.—p. 1079.
- Epinephrine Secretion from Adrenal Glands in Relation to Parathyroid Activity. J. M. Rogoff, G. N. Stewart, Pittsburgh, and Ruth Coriell, Chicago.—p. 1084.
- Insulin Allergy Simulating Coronary Occlusion: Case. H. F. Wechsler, L. Farmer and J. A. Urban, New York.—p. 1090.
- Role of Metals in Carbohydrate Metabolism. Z. T. Wirtschafter, Cleveland.—p. 1093.
- *Allergy in Relation to Purpura. J. W. Thomas and J. R. Forsythe, Cleveland.—p. 1105.
- Effect of Sulfapyridine on Staphylococcus Toxin: In Vivo Study in Rabbit. R. H. Rigdon, Anne Haynes and A. Lipscomb, Memphis, Tenn.—p. 1111.
- Electrocardiographic Changes Following Intravenous Administration of Magnesium Sulfate: III. Combined Effect with Digitalis. J. R. Miller and T. R. Van Dellen, Chicago.—p. 1116.
- Combinations of Lead, Arsenic and Other Chemicals with Experimental Asphyxia of Tumors. F. M. Allen, New York.—p. 1120.
- Experimental Uterotubal Insufflation in Rabbit: Preliminary Report. H. F. Newman, New York.—p. 1129.
- Treatment of Polycythemia Vera with Liver and Choline Hydrochloride. O. O. Meyer and Ethel W. Thewlis, Madison, Wis.—p. 1137.
- Further Studies on Effect of Massive Intravenous Infusions in Narcotic Poisoning. T. Koppanyi and R. A. Cutting, Washington, D. C.—p. 1140.
- Plasma Volume and Plasma Protein Concentration After Severe Hemorrhage. D. B. Calvin, Galveston, Texas.—p. 1144.
- Phenolphthalein Studies: Ratio of Free to Total Phenolphthalein in Urine: Its Influence on "Woldman Test." F. Steigmann and J. M. Dyniewicz, Chicago.—p. 1148.
- Effect of Sulfanilamide on Acid-Base Balance. E. W. McChesney, K. D. Sprague and I. H. Marshall, Rensselaer, N. Y.—p. 1154.
- Capacity of Kidney to Concentrate Urine in Acute Glomerulonephritis. R. Gregory, Galveston, Texas.—p. 1160.
- Blood Chemistry Determinations in Pernicious Anemia. E. W. Pernokis and M. R. Freeland, Chicago.—p. 1177.

Allergy in Relation to Purpura.—According to Thomas and Forsythe, an allergic factor was thought to play a part in the hemorrhagic purpura of 10 of 64 patients observed at the Cleveland Clinic. A complete allergy survey was made of these 10 patients and they were studied from the point of view of the various purpuric manifestations, age and sex incidence. There were 4 males and 6 females in the series. Age did not play a prominent part; the patients were equally distributed in the first, second, third, fourth and seventh decades. Of 7 patients having tourniquet tests 5 gave characteristic petechiae. The different purpuric manifestations were petechiae in 9, ecchymotic spots in 7, recurrent attacks of epistaxis in 4, bleeding gums in 3, bloody stools in 2, abnormal catamenia in 2 and cerebral hemorrhage in 1. Eight of the 10 patients had a positive family history of allergy. Thrombopenia was observed in 2 of them. One or more allergic manifestations were present and complained of by each of the 10 patients. Two patients (with a definitely reduced platelet count) presented frank and common allergic manifestations but showed no improvement of their purpuric symptoms until after splenectomy. Chronic nephritis was present in 2 of the 10 patients studied. The

authors state that allergy has to be ruled out as an etiologic factor in hemorrhagic purpura when a patient presents a frank allergy at the time of the appearance of purpuric lesions. Such an allergy should be investigated and controlled if possible. When patients fail to respond to general therapeutic measures, an allergy investigation is warranted even for patients with no history of allergy. In 1 of the authors' patients an inhalant factor was the cause, and when this factor was controlled the patient responded to treatment. Dietary restrictions alone controlled the purpura of another patient.

Journal of Nervous and Mental Disease, New York

93:421-560 (April) 1941

- Factors in Suicidal Attempts: Review of Twenty-Five Consecutive Cases. D. M. Palmer, Columbus, Ohio.—p. 421.
Pharmacologic Shock Treatment of Involutional Melancholia. J. Solovay and F. W. Schwarz, Camp Custer, Mich.—p. 443.
Modified Babinski Reflex (Resistance Reflex). E. Lichtmann, Kewanee, Ill.—p. 451.
Epileptic Insultus in Case of Tumor of Diencephalon. A. A. Boon and J. Doff, Amsterdam, Netherlands.—p. 453.
Progressive Muscular Atrophy and Syphilis: Report of Case with Interesting Cerebrospinal Fluid Findings. H. Cleckley and L. E. Geeslin, Augusta, Ga.—p. 460.
Electrokinetic Changes in Endolymph as Hypothetical Cause of Falling and Past Pointing Due to Stimulation by Galvanic Current. L. J. Pollock, I. Finkelman and I. C. Sherman, Chicago.—p. 473.

Journal of Pediatrics, St. Louis

18:429-566 (April) 1941

- Virus Diseases: Some Laboratory Phases. F. D. Stimpert, Detroit.—p. 429.
Pathology of Virus Disease. E. W. Goodpasture, Nashville, Tenn.—p. 440.
*Blood Volume in Normal Infants and Children. J. K. Brines, J. G. Gibson 2d and P. Kunkel, Boston.—p. 447.
Sulfonamide Drugs in Treatment of Experimental Dysentery Infection in Mice. M. L. Cooper and Helen M. Keller, Cincinnati.—p. 458.
Sulfathiazole Therapy of Infantile Diarrhea. G. Taylor, Durham, N. C.—p. 469.
Evaluation of Convalescent Serum in Prevention of Mumps. J. H. Lyday, Denver.—p. 473.
Treatment of Measles with Convalescent Serum and Concentrated Adult Normal Serum. J. L. Kohn, I. F. Klein and H. Schwarz, New York.—p. 476.
Diphtheria and Chemotherapy. H. E. Thelander, San Francisco.—p. 479.
Study of Relationship Between Fetal Position and Certain Congenital Deformities. C. C. Chapple, Philadelphia, and D. T. Davidson, Wilmington, Del.—p. 483.
*Primary Arteritis (Periarteritis Nodosa) Among Children. H. M. Keith and A. H. Baggenstoss, Rochester, Minn.—p. 494.
*Clinical Studies with Vitamin K in Newborn Infants. P. S. Astrowe, Kansas City, Mo., and E. S. Palmerton, Albert Lea, Minn., with assistance of Virginia Henderson.—p. 507.
Oral Typhoid-Paratyphoid Vaccine. D. W. Martin and D. H. Fogel, Durham, N. C.—p. 516.
Staphylococcal Meningitis Treated with Sodium Sulfathiazole. T. J. Donovan, Houston, Texas.—p. 518.
Severe Intestinal Hemorrhage Complicating Lobar Pneumonia: Case of Dieulafoy's Erosion in 5 Year Old Child. H. H. Clemens, Atlanta, Ga.—p. 524.
Following the Hypochondriac Child for a Decade. Esther Loring Richards, Baltimore.—p. 528.

Blood Volume in Children.—Brines and his colleagues determined the plasma, erythrocyte and total blood volume in 9 infants and 41 children from 2 to 17 years of age. The total blood volume is about 300 cc. at birth, doubles during the first year of life and then increases at the same rate in both sexes until puberty, when it is about 2,500 cc. Thereafter the volume in males increases more rapidly than in females, and when maximal growth is attained its level is the same as that of adults of equivalent physical measurements. Plasma and total blood volume are more closely related to physical size than to age. Unit volume in terms of plasma or whole blood per centimeter, kilogram or square meter is not constant but increases with continuing growth. Normal plasma, erythrocyte and total blood volume may be predicted on the basis of height, weight or surface area throughout infancy and childhood with a degree of accuracy which is sufficient for practical purposes. Height is the correlative factor of choice.

Primary Arteritis in Children.—Keith and Baggenstoss point out that the cause of periarteritis nodosa is still unknown. The reported range of age is from 3 months to 78 years. From 1866 through 1932 23 cases occurring in children were reported. From 1933 through 1939 21 more such cases were reported. The authors present 2 cases of their own which from the clinical point of view were dissimilar. The first patient (a boy

aged 14½ years) had an unexplained septic fever for at least five weeks at the onset of the disease. He was well for a month when cardiac symptoms occurred. He had attacks of tachycardia and chills, occasional cardiac pain and a sensation of "tightness" in the throat. Some months later nephritis developed and caused his death. His illness lasted sixteen months. The initial complaint of the second patient (a girl aged 3½ years) was pain with swelling in the left forearm and unsteadiness in walking. The swelling persisted with consequent stiffness of the elbow which may have been caused by occlusive arterial disease. She remained reasonably well for five months. Within three weeks of her death there developed abdominal pain and vomiting and terminal signs of peritonitis. The lesions in the 2 cases differed microscopically. In case 1 the lesions appeared as an acute or subacute suppurative process involving the walls of the vessels and extending beyond the adventitia. They were all in approximately the same stage of development, and alternative and exudative changes were predominant. In case 2 most of the lesions appeared to be regressing; proliferative changes were predominant whereas exudative phenomena in the arteries were relatively slight. The involvement of the fibrous connective tissues, especially in the lungs, heart and skin, was pronounced. The changes in the collagen fibers (fibrinoid degeneration) and the cellular proliferation were similar to those occurring in rheumatic fever. Eosinophilic leukocytes were not present in significant numbers in either case. Whether two different infectious agents were responsible cannot be decided definitely. There was nothing in the microscopic appearance of the arteries indicative of a specific etiologic agent. The first patient had suffered from renal insufficiency and hypertension (on the basis of the weight of the heart). The arterial changes may have resulted from these two factors, as necrotizing arteriolitis frequently occurs in hypertension associated with renal insufficiency. Macroscopic nodules and aneurysms were not present in either case and a correct diagnosis was possible only after microscopic study. That sufficient gross anatomic evidence is frequently absent is borne out by Rothstein and Welt, who stated negative gross observations at necropsy cannot rule out the possible presence of periarteritis nodosa and that the disease may be localized to one organ and that even that organ may reveal only microscopic changes. The authors believe that the several diseases now classified as "periarteritis nodosa" are only symptom complexes resulting from a wide variety of infectious or toxic agents. The disease apparently begins in the media. The authors prefer to call the symptom complex "primary arteritis" in order to designate inflammation of arteries in which infective agents are not demonstrable.

Vitamin K in Newborn Infants.—Astrowe and Palmerton determined the prothrombin concentration of 54 newborn babies, and that of their mothers at delivery, the relation of the mother's antepartum diet to the prothrombin level of her newborn infant, the effect of administration of vitamin K to the infant on the concentration of prothrombin and the effect of its administration to the mother during labor on the infant's prothrombin concentration. The deaths of twins with massive pulmonary and intracranial hemorrhage not attributable to any factor but the possible disturbance in blood coagulation led the authors to this investigation. Of the infants studied, 28 received no unusual treatment or medication, 18 received a liquid vitamin K concentrate and the mothers of 8 received vitamin K and bile salts while in labor. All but 1 of the infants survived. The one infant died at the age of 28 hours from a severe defect of the heart. In all but 3 of the 54 infants studied detailed reports of the maternal dietaries were obtained. The average prothrombin clotting time of the 28 control infants at birth was 38.4 seconds, of those who received vitamin K soon after birth it was 46 seconds, while that of the infants of mothers given vitamin K during labor was 34.2 seconds. During the third day the prothrombin clotting time of the respective groups was 51.8, 34 and 36.6 seconds. The quickest drop in the prothrombin clotting time took place in babies given vitamin K directly; even though they started with a higher prothrombin clotting time they were removed from the zone of potential hemorrhage in a much shorter time. The infants who had the lowest initial prothrombin levels were those of mothers who received vita-

min K concentrate during labor. Therefore it is concluded that vitamin K concentrate passes through the placenta and exerts a specific effect on the prothrombin concentration of the fetus, assuring a normal clotting mechanism. No relationship could be established between the mother's diet and the prothrombin level of her newborn infant. The completely adequate diet of today apparently does not protect the child from the danger of potential hemorrhage.

Maine Medical Association Journal, Portland

32:79-102 (April) 1941

- Some Problems of Anorectal Surgery. N. W. Swinton, Boston.—p. 79.
Diabetes, the Problem from the Standpoint of the Surgeon. H. Brinkman, Wilton.—p. 90.
Trends in Treatment of Tuberculosis. G. Young, Skowhegan.—p. 94.

Military Surgeon, Washington, D. C.

88:347-458 (April) 1941

- A Visit to the German Army Medical Service in 1937. E. E. Hume.—p. 347.
Tetanus Toxoid Immunization. L. R. Newhouse.—p. 371.
Gunshot Wounds. J. H. Gunter.—p. 375.
Surgical Technic in Modern Battle. G. M. Blech.—p. 387.
Mechanized Evacuation Within the Combat Regiment. C. R. Darnall.—p. 395.
The Diary of Assistant Surgeon Leonard McPhail on His Journey to the Southwest in 1835. H. W. Jones.—p. 413.

Philippine Medical Association Journal, Manila

21:63-118 (Feb.) 1941

- *Leukemoid Blood as Malignant Sign in Pertussis. J. Albert and A. P. Jongco, Manila.—p. 63.
Brief Review of Fundamentals of Nutrition. P. I. de Jesus, Manila.—p. 75.
Chinese Superstitions and Prejudices in Relation to Beriberi. Lydia Fehily, Hongkong, China.—p. 87.
Syringe Arrangement as Substitute for Leveling Bulb in Haldane Gas Analyzer. N. Cordero, Manila.—p. 91.

Leukemoid Blood as Malignant Sign in Whooping Cough.—Albert and Jongco discuss a nonleukemic blood picture observed in 62 cases of whooping cough complicated by bronchopneumonia. The leukocyte count varied from 50,000 to 216,000 per cubic millimeter of blood, with a preponderance of lymphocytes (from 51 to 91 per cent) in 36 cases, polymorphonuclears (from 61 to 88 per cent) in 9 cases and equal neutrophilic and lymphocytic percentage in the rest. Only the first total leukocyte count of 5 recovered patients was above 50,000; the subsequent counts were lower. The disease showed no evident predilection for either sex. More than 80 per cent of the patients were in their first two years of life. In general there was a tendency for the cases to increase with age up to 2 years and after this to decrease. The youngest patient studied was 1 month old and the oldest was 7 years. All the cases of whooping cough attended by high leukocyte counts were complicated by bronchopneumonia. In addition to the pulmonary infection of all the patients, 6 suffered from ileocolitis, 1 from lobar pneumonia of the other lung, 1 from suppurative meningitis and 1 from acute cardialgic beriberi syndrome. The clinical, physical and laboratory observations were indicative of acute infections. Forty-two patients were followed until death for from twenty to thirty days from the onset of fever. The shortest duration was eight and five-tenths days whereas the longest was sixty-one days. The high leukocyte count simulates acute leukemia, but the absence of severe anemia, glandular, liver and splenic enlargement, the tendency to hemorrhage, the leukemic cellular infiltrations in the different organs and tissues and the low percentage of immature cells in the peripheral blood make it different from leukemia. That the high leukocyte counts are reactions of the individual to the infection and not leukemia itself is well shown by the absence of the clinical evidences of the latter disease and also by the blood counts of the recovered patients. As soon as the infection was controlled and improvement began, the leukocytes decreased correspondingly and were normal when the symptoms subsided. Follow-up of the recovered patients three or more years after discharge from the hospital showed them in the best of health. The absence of basophilia and eosinophilia ruled out chronic leukemia. The lymphatic cell infiltration of the bone marrow, found in acute and chronic leukemias, was also absent, as were the secondary anemia and the numerous nucleated erythrocytes

found in all leukemias. That the leukemoid blood picture is not a terminal manifestation of the disease is shown by the fact that only 4 of the patients died within the first twenty-four hours after the abnormally high leukocyte counts were discovered, whereas 11 patients lived for one to three days more and the rest for more than three days. The impression that the leukemoid blood picture is not necessarily a manifestation of the disease immediately preceding death is further corroborated by the recovery of some of the patients. The grave prognosis of bronchopneumonia cases secondary to whooping cough, when attended by a leukemoid blood picture, especially if it persists, makes leukocyte counts in every case of whooping cough with bronchopneumonia imperative so that the serious cases can be differentiated from those that are clinically mild and moderate. The treatment of these patients with sulfapyridine and sulfathiazole is hopeful. The drug should be continued for from forty-eight to seventy-two hours after the temperature has become normal. The toxic effects of the drug should always be borne in mind and carefully watched, especially the destructive changes in the hemopoietic organs.

Public Health Reports, Washington, D. C.

56:547-608 (March 21) 1941

- War and Infectious Disease. Clara E. Council.—p. 547.
Carbon Disulfide: Its Toxicity and Potential Dangers. Division of Industrial Hygiene.—p. 574.
Experimental Poliomyelitis: Use of Variety of Laboratory Technics in Efforts to Establish Seven Strains of Poliomyelitis Virus in the Cotton Rat. S. D. Kramer and W. N. Mack, with assistance of A. T. Himes.—p. 581.
Three New Species of Ornithodoros (Acarina: Ixodoidea). R. A. Cooley and G. M. Kohls.—p. 587.

56:609-678 (March 28) 1941

- Illness and Accidents Among Persons Living Under Different Housing Conditions: Data Based on the National Health Survey. R. H. Britten and I. Altman.—p. 609.
Factors Influencing Efficacy of Phenolized Rabies Vaccines: II. Virus Content of Vaccine. K. Habel.—p. 641.
Complement Fixation in Endemic Typhus Fever. Ida A. Bengtson.—p. 649.

56:679-750 (April 4) 1941

- Hydrogen Sulfide: Its Toxicity and Potential Dangers. Division of Industrial Hygiene.—p. 684.
Tissue Factors in Antirabies Immunity of Experimental Animals. K. Habel.—p. 692.
Incidence of Cancer in Detroit and Wayne County, Michigan, 1937. A. J. McDowell.—p. 703.

56:815-870 (April 18) 1941

- Mechanical Aids for Stream Surveys. C. T. Carnahan.—p. 815.
Studies on Immunizing Substances in Pneumococci: XI. Effect of Variation in Dosage of Antigenic Polysaccharide on Serum Antibody Titer in Human Beings. L. D. Felton, W. R. Cameron and P. F. Prather.—p. 822.
*Studies on Trichinosis: XIII. Incidence of Human Infection with Trichinae as Indicated by Postmortem Examination of 3,000 Diaphragms from Washington, D. C., and Five Eastern Seaboard Cities. K. B. Kerr, L. Jacobs and Eugenia Cuvillier.—p. 836.

Incidence of Trichinosis.—Kerr and his collaborators present the third and final report on the distribution of trichinosis in the general population of the United States. The first reports were on 300 and on 1,000 postmortem examinations of diaphragm muscles. The present report deals with 3,000 diaphragms from the hospitals of Washington, D. C., and from five Atlantic seaboard cities. The material from the Washington hospital is considered representative of the general population and that from the other cities covers a civilian seamen population. The material also provided an adequate sampling as to age, sex, race, occupation, mentality and social and economic status. None of the persons included in the survey died of trichinosis. A total of 488 diaphragms among the 3,000 was found infected with trichinae (an incidence of 16.3 per cent); 66 per cent of the 488 positive specimens were detected by the microscopic method and 62.7 per cent by the Baermann digestion method. With the direct microscopic method on 100 Gm. specimens recorded as negative by routine methods, 6 positive specimens were found, indicating that the incidence figure is probably less than the true incidence. The methods used have disclosed all the heavy infections which undoubtedly represented clinical trichinosis at some time or other, as well as numerous light infections of unknown bearing on the health of the person. Probably some infections of dead trichinae of the order of less than one larva per gram of muscle have not

been disclosed. From the standpoint of the health of the person such infections are probably without significance, but they are of value in emphasizing the existing widespread distribution of the parasite in the population and of delineating further the potential hazards involved in the present haphazard methods of dealing with this important public health problem. The 670 diaphragms received from hospitals located outside of Washington, D. C., revealed a trichina incidence of 18.8 per cent with a standard deviation of 1.57. Since this incidence is not significantly different from 16.3 per cent for the series as a whole, it seems probable that it may be the incidence to be found in other sections of the United States. Among the 2,330 diaphragms from hospitals in Washington, D. C., 362, or 15.5 per cent, were infected with trichinae. The standard deviation of this incidence figure is 0.75. Most of the positive specimens presented fairly light trichina infections, but 1.6 per cent contained more than one hundred larvae per gram of muscle and in such cases it may be assumed that the persons probably suffered from clinical trichinosis at some time. As the material is generally representative of an urban population, to whom most of the garbage-fed hogs are marketed, it is possible that the infection rate among this population is higher than that of a rural population. The proof of this supposition is being verified by a survey being conducted on a rural population.

Review of Gastroenterology, New York

8:77-192 (March-April) 1941

- Diverticulitis. W. W. Babcock, Philadelphia.—p. 77.
Gastrosopic Observation of Multiple Gastric Erosions, with Prompt Response to Histaminase. P. T. Knies and C. P. Pritchett, Columbus, Ohio.—p. 92.
Gastrosopy as Diagnostic Procedure: Clinical Study with Illustrative Cases. A. L. Levin and M. Shushan, New Orleans.—p. 103.
Etiology and Methods of Diagnosis and Treatment of Peptic Ulcer. G. M. Russell, Billings, Mont.—p. 114.
Studies on Digestion of Milk in Vivo. Dorothy Fetter, Brooklyn.—p. 120.
The Gastroenterologist and the Cholesterol Problem. H. W. Soper, St. Louis.—p. 127.
Treatment of Flatulence. M. S. Shaime, New York.—p. 131.
John Abercrombie and His Work. J. D. Adamson, Winnipeg, Canada.—p. 134.
Gallbladder Disease in Patients Under 40 Years of Age. C. Bearse, Boston.—p. 143.
Predilection of Women for Gallstone Formation. H. Rothmann, San Francisco.—p. 148.
Portal Cirrhosis. A. Levitt, H. T. Schweitzer and S. J. Weisman, Buffalo.—p. 154.
Treatment of Mucous and Ulcerative Colitis with Low Carbohydrate Diet; Role of Liver in Blood Sugar Regulation. B. P. Sandler, New York.—p. 157.

Rhode Island Medical Journal, Providence

24:57-74 (April) 1941

- Providence Medical Association. J. G. Walsh, Providence.—p. 57.
Correlation of Aorta Associated with Pregnancy. C. C. Dustin and H. L. C. Weyler, Providence.—p. 59.
Chemotherapy in Infections of Genitourinary Tract. H. K. Turner, Providence.—p. 62.

Rocky Mountain Medical Journal, Denver

38:257-336 (April) 1941

- Therapeutic Value of Blood and Blood Substitutes. C. C. Sturgis, Ann Arbor, Mich.—p. 274.
Selective Service Act in Its Relation to the Prevention of Tuberculosis. J. W. Amesse, Denver.—p. 286.
Notes on Disease in the Far East. A. G. Ellis, Colorado Springs, Colo.—p. 289.
Gastric Resection for Gastric and Duodenal Lesions. F. F. Hatch, Salt Lake City.—p. 292.
Immunization Against Whooping Cough. J. D. Le Mar and J. G. Markle, Omaha.—p. 297.
Can a Small Hospital Afford a Good Accounting System? G. A. Logan, Denver.—p. 299.

South Carolina Medical Assn. Journal, Greenville

37:75-108 (April) 1941

- Spontaneous Subarachnoid Hemorrhage: Report of Six Cases. E. B. Poole, Greenville.—p. 75.
Life Expectancy. W. S. Fewell, Greenville.—p. 78.
Sulfathiazole in Staphylococcal Infections: Report of Three Cases from the Greenville General Hospital. A. C. Parker Jr. and H. Smith, Greenville.—p. 81.
Congenital Malformation of Anus—Operative Cure. G. T. Tyler Jr., Greenville.—p. 83.

Southern Medical Journal, Birmingham, Ala.

34:343-452 (April) 1941. Partial Index

- Body Section Radiography in Diagnosis of Aortic Aneurysms and Mediastinal Tumors. W. G. Scott, S. Moore and T. G. Russell, St. Louis.—p. 343.
*Hiatus Hernia of Stomach: Incidence, Symptoms and Medical Management in 1,220 Gastrointestinal Cases. M. D. Levy and L. B. Duggan, Houston, Texas.—p. 351.
Car Window Elbows. H. B. Shorbe, Oklahoma City.—p. 372.
Pathogenicity of Strains of Brucella Obtained from Cases of Hodgkin's Disease. W. D. Forbus and J. U. Gunter, Durham, N. C.—p. 376.
*Neural Myatrophy and Vitamin E. W. de Gutiérrez-Mahoney, Nashville, Tenn.—p. 389.
Use of Liver Extract in Lupus Erythematosus: Preliminary Report. H. King and C. M. Hamilton, Nashville, Tenn.—p. 394.
Common Nutritional Fallacies. W. Weston, Columbia, S. C.—p. 397.
Uterine Bleeding from the Point of View of the Obstetrician. N. J. Eastman, Baltimore.—p. 405.
Genital Bleeding from the Gynecologist's Point of View. R. W. TeLinde, Baltimore.—p. 408.
Endocrinopathic Uterine Bleeding. E. Novak, Baltimore.—p. 410.
Gastrointestinal Allergy: Its Present Status. A. F. R. Andresen, Brooklyn.—p. 418.
Further Observations on Pathogenesis and Localization of Pulmonary Tuberculosis. B. L. Brock, Waverly Hills, Ky.—p. 434.

Hiatus Hernia of Stomach.—Levy and Duggan report 26 cases of esophageal hiatus hernia encountered among 1,220 gastrointestinal roentgenograms. The ages of the patients were essentially the same as those reported by other workers, the youngest patient being 31 and the oldest 79. Nine of the patients were men and 17 women; most of them were either of the full sthenic or hypersthenic habitus. Only 1 had anemia, presenting symptoms of a bleeding duodenal ulcer, but on roentgen examination only an esophageal hernia was observed, at fluoroscopy the duodenum appearing normal. Stool examinations were made as a routine, and evidence of bleeding from the intestinal tract was found only in the anemic patient. The authors find that roentgen examination in the prone position through the right anterior oblique angle is best for showing esophageal hernia. Deep inspiration and expiration during the examination will assist in spotting the hernia. When radical cure of hernia is prevented because of the patient's condition, phrenic nerve interruption is the only surgical measure which may be employed. Medical treatment varies with the individual case and is largely symptomatic. The diet must be bland and high in vitamins; the meals divided into four to six small feedings, never before bedtime. If fulness is complained of after eating, the patient should walk about for a few minutes. Sleeping at an angle of 45 degrees has been found beneficial. Spastic constipation is a frequent accompaniment and is relieved by simple lubricants and antispasmodic drugs so that straining at stool will not occur. If anemia is present it is treated by appropriate methods. Gratifying results in cases showing gastric or intestinal irritative symptoms have been had from the use of equal parts of bismuth subnitrate and bismuth subcarbonate thirty minutes before eating. The psychic factor is a most important consideration. Great mental distress may be produced if too much emphasis is placed on a condition which can be treated only symptomatically. The authors have stressed the effect of treatment of the associated changes, such as spastic constipation, rather than directing the patient's attention to his physical defect. This, they believe, has saved some of their patients from a true neurosis, and it has made it definitely easier and more agreeable to treat them. Medical treatment has proved successful for most of their patients. Esophageal hiatus hernia is not uncommon and when kept in mind during the examination of patients will be found in from 2 to 3 per cent of gastrointestinal roentgenograms. The symptoms presented may be cardiac, respiratory, gastrointestinal or constitutional. Associated gastrointestinal disorders are frequent and may be more important than the hernia.

Neural Myatrophy and Vitamin E.—Gutiérrez-Mahoney considers types of neural myatrophy which from their first recognition have been called progressive muscular atrophy. Depending on the distribution of the wasting and the presence or absence of spasticity they have been variously named bulbar palsy, pseudobulbar palsy, a combination of these two, atrophy

of the muscles, amyotrophic lateral sclerosis or combinations of all these. They are one and the same disorder, affecting mainly the motor neurons ("motor neuron disease"). He cites his experimental and clinical observations begun in June 1938. Because of the clinical and microscopic changes which followed deficiency of vitamin E in the diet of rats and could be prevented if vitamin E was added to these diets, the author felt, in spite of some dissimilarity between the clinical and pathologic pictures of the rats and of patients suffering with progressive muscular atrophy, that the administration of vitamin E to these patients might be beneficial. During the two years he has seen and treated 9 patients with the type of neural myatrophy which from experimental and clinical studies seemed to come under the E deficiency class. Three patients showed no improvement following treatment with a defatted concentrate of vitamin E from wheat germ oil. They had the advanced stage of the disease and were suffering from bulbar palsies as well as from peripheral wasting. The other 6 improved; 3 of those had wasting with weakness of the hand muscles, 1 had wasting about the neck and shoulder girdle and the other 2 had little wasting but definite spasticity. Two of the patients with wasting of the hand muscles and 1 with spasticity of all limbs discontinued taking the vitamin concentrate after having had improvement, and their condition regressed to their previous disability. They resumed taking the material, and improvement recurred. One of these lapsed in treatment a second time, and his condition became worse but again improved when he took the wheat germ oil concentrate. With the improvement of the localized weakness a marked increase in the general strength and vigor of these patients occurred. In 2 patients there was filling in of the previously wasted hand muscles. One man continued to have fasciculation of his muscles, though to a diminished degree, with improvement during the two years of observation from an inability to walk without a stick to being able to run well and to return to work. Improvement usually took place within a fortnight to a month after starting to take vitamin E. Treatment of the dystrophies in which the nervous system is not intact did not cause any improvement in the patients' condition. These control observations included the muscular dystrophies, myasthenia gravis and thyrotoxic myatrophy. Thus the author feels that there are some neural myatrophies due to a deficiency of vitamin E which can be corrected if identified early and by supplying vitamin E before the condition has progressed to the stage where too many of the nerve cells have been irreversibly damaged. He suggests the possibility that infantile cerebral palsy results from vitamin E deficiency in the mother before birth and during lactation. In tracing the probable cause of the trouble one is often unable to attribute it to any of the suggested possibilities, and it does not seem unreasonable to him to assume that the palsy is due to the deficiency. To demonstrate this conclusively, administration of vitamin E to a large and carefully observed series of pregnant women would be required; and this would have to be controlled by a series not given supplementary vitamin E, with subsequent calculation of the incidence of infantile cerebral palsy in the offspring of each group. Vitamin E might also be administered to newborn children as soon as infantile cerebral palsy is recognized, with the hope of preventing further disability and possibly of correcting the condition itself.

Southern Surgeon, Atlanta, Ga.

10:225-300 (April) 1941

- Medicine in the National Defense Program. I. Abell, Louisville, Ky.—p. 225.
Prevention of Deformities in Compound Fracture Treatment. C. S. Venable and W. G. Stuck, San Antonio, Texas.—p. 234.
Immunologic Prophylaxis and Therapy in Human Staphylococcal Infections. A. B. Langacre, New Orleans.—p. 247.
Pseudomyxoma Peritonei from Ruptured Mucocele of Appendix. D. P. Hall, Louisville, Ky.—p. 264.
Carcinoma of Prostate: Its Conservative Surgical Treatment. G. J. Thompson, Rochester, Minn.—p. 271.
Ovarian Hormone Harmony. M. J. Bennett, Philadelphia, and P. B. Russell Jr., Memphis, Tenn.—p. 279.
Ludwig's Angina. J. I. Berlin, Jersey City, N. J.—p. 289.

Surgery, Gynecology and Obstetrics, Chicago

72:679-822 (April) 1941

- Experimental Analysis of Growth Pattern and Rates of Appositional and Longitudinal Growth in Rat Femur. L. J. Aries, Chicago.—p. 679.
Tensile Strength of Sutured Skin Wounds During Healing. T. W. Botsford, Boston.—p. 690.
Malignant Lesions of Cecum and Ascending Colon. C. W. Mayo and W. R. Lovelace 2d, Rochester, Minn.—p. 698.
*Omental Adhesions Syndrome: Postoperative Dysfunction of Transverse Colon. J. C. McCann, Worcester, Mass.—p. 707.
*Intra-Abdominal Application of Sulfanilamide in Acute Appendicitis. J. E. Thompson, J. A. Brabson and J. M. Walker, New York.—p. 722.
Neurogenic Factor in Intestinal Obstruction. R. F. Antonice, Cleveland, and H. Lawson, Louisville, Ky.—p. 728.
*Fat Embolism: Clinical and Experimental Study. C. S. Scuderi, Chicago.—p. 732.
Experiences with Intramedullary Tractotomy: IV. Surgery of Brain Stem and Its Operative Complications. F. C. Grant and L. M. Weinberger, Philadelphia.—p. 747.
Experimental Cerebral Trauma: II. Further Observations on Fluid Content of Brain Following Trauma to Head. C. Pilcher, Nashville, Tenn.—p. 755.
Plasma Prothrombin Values of Mothers and Infants at Delivery: Further Studies Including Comparative Values of Umbilical Arteries and Veins. R. F. Norris and M. C. Bennett, Philadelphia.—p. 758.
Results of Plastic Operations on Renal Pelvis and Ureter. A. Hyman and S. F. Wilhelm, New York.—p. 764.
Use of Lag Screw for Internal Fixation of Intertrochanteric Fractures of Femur. M. A. Casberg, St. Louis.—p. 772.
Combined Traction-Compression Method for Treatment of Bicondylar Fracture of Tibia. R. A. Wise, New York.—p. 778.
Relation of Pyelonephritis to Toxemias of Pregnancy. G. C. Prather and W. Sewall, Boston.—p. 781.
Mixed Intracranial Gliomas: Diagnostic and Prognostic Significance of Adequate Histologic Examination. D. Munro, Jessie E. Edwards and W. O. Russell, Boston.—p. 787.
Juvenile Kyphosis. J. T. Hodgen and C. H. Frantz, Grand Rapids, Mich.—p. 798.
Results of Splenectomy in Gaucher's Disease. V. W. Logan, New York.—p. 807.

Omental Adhesions Syndrome.—McCann discusses 23 consecutive cases of omental adhesion syndrome encountered during seven years. The preponderance of the condition among women was striking, there being 20 out of 23. There was an etiologic incidence of fourteen appendectomy incisions among women as against three appendectomy incisions among men. Possibly the higher incidence of a ptotic habitus and low lying colon and omentum among women has some bearing on the anomaly. The primary operation which caused adhesions in 12 patients was performed before the age of 20, during the twenties in 7, during the thirties in 3 and after 50 in 1. This makes the lesion a surgical hazard of youth. The interval between the primary operation and the onset of symptoms ranged from a few months to nineteen years, the average being three and one-half years. The current operation was performed at an average age of 33 years. Twelve patients had interval operations with no relief, unaffected gallbladders and pelvic organs having been removed. The etiologic significance of infection as compared with aseptic trauma does not appear impressive. The operations of 10 of the 16 patients for whom complete hospital records were available revealed clean surgical procedures with no infection at the time of operation, the peritoneum was closed without drainage, the postoperative course was uneventful and the patients were discharged early with cleanly healed incisions. Only the factor of aseptic trauma may be fairly incriminated in these cases. In the 3 patients whose operation was done for acute appendicitis there was no record of infection of the peritoneal cavity at the time of operation, drainage was not instituted, the incision healed cleanly by first intention and the patients were discharged early. Infection may have played a minor role in this group, but operative trauma appears to have been the major factor. The records of the 3 remaining patients revealed that acute suppurative appendicitis with peritonitis for which drainage was carried out was present. Infection in this group was probably the dominant factor in causing adhesions. It appears that in 60 per cent of the patients the adhesions resulted from aseptic operative trauma, in 23 per cent from aseptic trauma and in 17 per cent from infection. Diagnosis may be difficult if not all the components of the syndrome are present. The lesion is confused with gallbladder disease, ulcer, pelvic disease and postoperative hernia. The

most difficult differentiation is between omental adhesions and adhesions of the small intestine. The cyclic recurrence of obstruction-like episodes characterized by early reflex vomiting of stomach contents, usually with spontaneous subsidence, is the chief distinguishing characteristic of omental adhesions. A history of "effort" or "traction" colic and "colon" features also suggest omental adhesions. "Fecal" vomiting, instead of "reflex" vomiting, almost commits the diagnosis to adhesions of the small intestine. The chief offense is labeling these sufferers "psychoneurotic," as were 14 of the present series. Probably many functional diagnoses of atonic or spastic constipation, colitis, irritable colon and functional indigestion (all fortified by negative roentgen reports) represent inadequate evaluation of the secondary functional manifestations of omental adhesions. Operative intervention resulted in 12 patients being completely relieved, 2 patients 75 per cent improved, 4 patients 50 per cent improved and 2 entirely unrelieved. One of these patients died from unexplained intestinal obstruction unrelieved by ileostomy and 1 was followed for four years, when the patient died from recurrent vomiting, debility and inanition.

Sulfanilamide Intra-Abdominally for Acute Appendicitis.—Thompson and his associates present an analysis of acute appendicitis at the Roosevelt Hospital from 1935 through 1940. The first five years represent an average background against which they hope to contrast the 1940 results in which patients were treated by intra-abdominal application of sulfanilamide. During the first five years 741 patients with acute suppurative appendicitis were operated on with 20 deaths, or a mortality rate of 2.7 per cent. The majority of the deaths were directly attributable to peritonitis. The mortality rates for the abscess and peritonitis group are low as compared generally with statistics from other hospitals. During 1940, 204 patients with appendicitis were treated. The proportionate number of patients with abscess and with peritonitis was the same. There were no deaths from the disease in any one of the three varieties (acute, abscess or peritonitis). Complications were relatively few in the total series, and there was a noticeable reduction in wound infections and secondary peritoneal abscesses as compared with the previous years. Sulfanilamide was administered intra-abdominally to nearly all the patients during 1940 in whom there was real or suspected infection of peritoneum. Complications seemed less frequent and, when present, less severe. The drug had no severe toxic effects and failed to show any destruction of tissues locally. The only local effect noticeable was the rapidity of healing. The average adult dose recommended in cases of peritonitis is 8 Gm. intraperitoneally and 4 Gm. placed in the layers of the abdominal wall. A few grams more can be used in the treatment of severe diffuse peritonitis and less when the peritonitis is localized. The appendical abscess seems to lose the drug more rapidly by drainage, and it is safe to use a total of 20 Gm. The authors endorse the use of sulfanilamide intra-abdominally when indicated. They do not wish to suggest that the mortality rate from the disease with the use of the drug will henceforth be zero, as there were no deaths from embolism or other conditions entirely dissociated from peritonitis, but it is their conviction that the reduced mortality rate during the year 1940 was due to sulfanilamide.

Fat Embolism.—According to Scuderi, there is evidence in the literature to show that the postmortem table is not the last court of appeal for fat embolism following fractures. Quantitative blood fat determinations are of no value in the diagnosis, because the physiologic variations are too extensive. Qualitative darkfield examinations of the blood should aid the diagnosis when done by trained microscopists. Only the last few cubic centimeters of a catheterized specimen of urine are valuable for examination in suspected cases. His uniform experimental results make him feel that intravenous fat droplets, if present in sufficient quantity, will produce changes in the pulmonary fields, detectable by roentgen study. The sizzle test, with a platinum loop and a Bunsen burner, is accurate in 1:1,400 to 1:1,600 dilution. The sudan III technic of staining urine and blood specimens in order to be accurate must be performed as follows: (1) The stain must be fresh, (2) a high concentration of the dye is necessary to stain the fat droplets, (3) the stain must be permitted to act on the fat for at least five minutes, (4) orange droplets smaller than from 3 to 4

microns are either contamination or undissolved stain and (5) a drop of stain must be added directly to the slide and not to a test tube specimen. Fat droplets are excreted exclusively through the tubules of the kidney if the concentration of fat reaches 0.75 cc. or more per kilogram of body weight. Surface tension studies of blood serum are of no value in this condition because variables are too numerous. Since all the bone marrow fat extracted from a femur is not sufficient to cause death, the author believes from experimental evidence that oleic acid is the probable etiologic factor. This substance is seven times as lethal as neutral bone marrow fat, and a sufficient quantity could easily be available. Experimentally animals can be made resistant to lethal doses of intravascular fat provided the injections are given in gradually increasing doses. The mechanism of this phenomenon is not clear. Whether it is due to an increased tissue resistance or to the formation of an emulsifying agent requires further determining study.

Virginia Medical Monthly, Richmond

68:189-246 (April) 1941

- Importance of Neuropathology to Psychiatry. J. B. Pettis, Staunton.—p. 189.
Spirochetal Jaundice (Weil's Disease). N. Bloom and H. Walker, Richmond.—p. 192.
Clinical Use of Heparin for Thrombosis. E. I. Evans, Richmond.—p. 200.
Remembrances—Personal and Otherwise. R. H. Garthright, Vinton.—p. 204.
Circulatory and Respiratory Disturbances of Erect Posture. R. J. Main and J. P. Baker Jr., Richmond.—p. 210.
Intussusception Complicating Tuberculous Enteritis: Report of Case. J. U. Gunter and H. H. Trout, Roanoke.—p. 213.
Acute Epipharyngitis. F. H. McGovern, Danville.—p. 214.
Is Routine Circumcision of Male Children at Birth Justifiable? W. McMann, Danville.—p. 216.
Hemorrhage from Meckel's Diverticulum: Report of Case. F. R. Crawford, Farmville.—p. 219.
The General Practitioner's Future. C. F. Manges, Blacksburg.—p. 221.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

49:135-196 (March) 1941

- Transplantation of Fascia Lata in Cystopexy. W. J. Carson, Milwaukee.—p. 135.
Simple, Safe Appendectomy Technic. M. Kahn and M. W. Bay, Los Angeles.—p. 138.
Diverticulosis of Small Intestine. R. M. Dodson, Portland, Ore.—p. 143.
Plea for Early Diagnosis of Spinal Cord Tumor. J. Raaf, Portland, Ore.—p. 147.
Anastomosis of Vas Deferens: Case Record with Details of Repair. M. T. Nelsen, Tacoma, Wash.—p. 152.
Short Wave in Surgery. K. Schlaepfer, Milwaukee.—p. 153.
Extraperitoneal Cesarean Section: Modification of Latzko Technic with Report of Thirty-Two Cases. J. C. Irwin, Los Angeles.—p. 158.
Resuscitation of the Newborn. W. B. Thompson and E. J. Krahulik, Los Angeles.—p. 169.
Problem of Cesarean Section in the Potentially or Actively Infected Parturient with Obstructed Labor. E. M. Lazard, Los Angeles.—p. 186.

West Virginia Medical Journal, Charleston

37:193-240 (May) 1941

- Technic of Blood Grouping and Cross Matching. E. E. Myers and E. E. Boehm, Philippi.—p. 193.
Cyclic Discomfort or Dysmenorrhea. A. P. Hudgins, Charleston.—p. 199.
Radiation Therapy of Carcinoma of Skin. V. L. Peterson, Charleston.—p. 204.
Vitamin K and Its Use in Prevention and Treatment of Hemorrhage. R. J. Stevens, Huntington.—p. 206.
Lead Encephalopathy Complicating Torula Infection. R. M. Burton, Toledo, Ohio.—p. 212.
New Criteria in Treatment of Diabetes Mellitus with Protamine Zinc Insulin. L. B. Gang, Huntington.—p. 214.
Anastomosis of Vas Deferens (Case Report). J. F. Barker, Huntington.—p. 222.

Wisconsin Medical Journal, Madison

40:269-360 (April) 1941

- Prostatic Resection: Some Facts and Fancies Revealed by Time. J. C. Sargent, Milwaukee.—p. 285.
Extensive Plastic Repair for Restoration of Lower Lip: Report of Procedure in Case in Which Lower Lip Was Entirely Removed for Eradication of Epithelioma. M. N. Federspiel, Milwaukee.—p. 289.
Quinidine Therapy: Its Use in Long Standing Auricular Fibrillation with Congestive Failure. J. P. Bertucci, Ishpeming, Mich.—p. 292.
Successful Ligation of Patent Ductus Arteriosus: Report of Case. J. W. Gale, F. J. Pohle and H. Romaine, Madison.—p. 296.
Puerperal Psychoses. S. Wick, Waawatosa.—p. 299.
An Internist Considers Acute Abdominal Disease. S. Boyer Jr., Duluth, Minn.—p. 303.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1:349-390 (March 8) 1941

- *Primary Thrombosis of Cerebral Veins (Following Childbirth). J. P. Martin and H. L. Sheehan.—p. 349.
The Recruit's Heart. E. N. Chamberlain.—p. 354.
Allergic Eczema and Cataract. J. G. Milner.—p. 356.
X-Ray Treatment of Inoperable Carcinoma of Rectum Without Colostomy. F. Roberts.—p. 357.
Value of Vitamin B₁ in Diphtheria. G. E. Donovan and M. Bannister.—p. 359.
Treatment of Gingivitis with Ascorbic Acid. H. G. Campbell and R. P. Cook.—p. 360.

Primary Thrombosis of Cerebral Veins.—Martin and Sheehan discuss the clinical and pathologic features of primary cerebral venous thrombosis as observed in 6 cases. In 2 the diagnosis was established at necropsy and in 1 at an exploratory operation. A fourth case came to necropsy three years after onset, and in 2 the diagnosis is presumed because of similarity of symptoms and circumstances with those in the verified cases. The symptoms in 5 occurred after childbirth. Such cases have usually been regarded as instances of "late eclampsia" or cerebral embolism. Primary cerebral venous thrombosis occurs in the puerperium and in general and local infection—especially in infections associated with vomiting or diarrhea. As a result of venous blockage, softening accompanied in some cases by hemorrhage occurs in the brain and a permanent residual scar is left on the cerebral cortex. The main clinical features are convulsions and paralysis. The convulsions may be local or general. Occasionally they may be absent. Premonitory symptoms (headache, weakness and cramps) occur in many cases. A small amount of blood may be found in the cerebrospinal fluid. The convulsions probably coincide with the sudden obstruction of the meningeal vein and the formation of red thrombus in it. They are to be ascribed to cellular disturbances in the area of cortex in which the venous drainage has been abruptly arrested. The exact site of the lesion is not of great moment: convulsions seem to occur almost as frequently when nonmotor cortex is involved as when motor cortex is concerned. Recurrence of convulsions after a free interval may indicate that the thrombosis is spreading. Prolonged coma has a grave prognostic significance. After the convulsions, if the lesion is in the frontal or occipital area, no paralysis may be observed. If the motor cortex is involved there is usually complete paralysis of one limb and weakness of the rest of that side of the body. Much of the treatment is on obvious lines. From 0.13 to 0.2 Gm. of phenobarbital by mouth or intravenously will usually control the convulsions, and afterward smaller doses should be administered for a week or two. Massage or passive movements should be given to the paralyzed limbs. Unless other complications supervene, a good recovery follows in a few weeks. Since often there is evidence of extension of thrombosis after the first symptoms, the administration of heparin should be considered as soon as the condition is recognized. In the puerperal cases the danger of uterine hemorrhage seems a risk in its use, and in all other cases the danger of liberating emboli will have to be taken into account.

1:427-468 (March 22) 1941

- Crush Injuries with Impairment of Renal Function. E. G. L. Bywaters and D. Beall.—p. 427.
Crush Injury with Renal Failure: Case. D. Beall, E. G. L. Bywaters, R. H. R. Belsey and J. A. R. Miles.—p. 432.
Limb Compression Ending Fatally in Uremia: Case. R. Mayon-White and O. M. Solandt.—p. 434.
*Antibody Response and Systemic Reactions After Inoculation of New Type of T. A. B. C. Vaccine. A. Felix, S. G. Rainsford and E. Joan Stokes.—p. 435.

Antibody Response and Reactions After Typhoid Vaccine.—Felix, Rainsford and Stokes record the results of comparative trials in man of new and old types of typhoid vaccine. The local and general reactions were observed and the immunity was measured by the estimation of the Vi and O

antibody content of serums. From preceding experiments it seemed justifiable to expect that the new alcohol killed and alcohol preserved typhoid-paratyphoid vaccines would stimulate Vi antibody response in an outstanding manner and could, by this property, be distinguished from ordinary heat killed and phenolized vaccines. To test this point serums for estimating antibody response were labeled only with serial letters and numbers, without indicating which of the vaccines had been used for the inoculation of any particular group of volunteers. In each of the three trials the group that had been inoculated with the new type of vaccine could be determined from the results of the Vi agglutination tests. Two pronounced differences were found between subjects inoculated with the two types of vaccine: 1. The alcohol killed and alcohol preserved vaccines stimulated demonstrable typhoid Vi antibodies in a relatively high proportion of cases, whereas the Vi antibody response to ordinary vaccines was almost negligible. No significant difference in O antibody response was observed. 2. The reactions produced by the alcoholized vaccine were much milder than those caused by ordinary vaccine. General reactions were absent or trivial. The local reaction was of a modified type and hardly ever restricted movement of the arm. There was no correlation between Vi or O antibody response and the severity of the general or local reactions. In recommending dosage and intervals between the two injections the authors point out that the alcoholized vaccine is equivalent in composition and total bacterial count to the customary vaccine—i. e., it contains one thousand million *Bacterium typhosum* and five hundred million each of *Bacterium paratyphosum* A, B and C per cubic centimeter of vaccine. The following doses of this vaccine are recommended: for the first and second dose, respectively, for adult men 0.25 and 0.5 cc., for adult women 0.2 and 0.4 cc., for male or female children from 16 to 18 years of age 0.2 to 0.4 cc., for children from 13 to 15 years of age 0.1 and 0.2 cc., for those from 9 to 12 years of age 0.05 and 0.1 cc., and for children less than 8 years of age 0.05 and 0.05 cc. These are maximal doses and should not be exceeded. The next smaller dose is advised for persons in each category who are below average in physical vigor or development. The interval between the two injections should be three weeks. If this cannot be adhered to and the choice is between two or four weeks, the longer interval should be chosen. Revaccination is advisable one year after the primary immunization: one injection of the first dose. Reactions are either absent or trivial, especially if the injections are given not earlier than six hours before bedtime. In certain susceptible persons a small fluctuating area may develop even after a small dose. No treatment is necessary or advisable for local reactions. Susceptible subjects should receive only half as much vaccine for their second as for their first dose. So far reports on the reactions in about 250 adult women and 150 adult men given reduced doses of the alcoholized T. A. B. C. vaccine have been received and there have been no delayed local reactions.

Indian Medical Gazette, Calcutta

76:1-64 (Jan.) 1941

- *Treatment of Hookworm Anemia. L. E. Napier, C. R. Das Gupta and D. N. Majumdar.—p. 1.
Rheumatic Heart Disease. U. P. Basu.—p. 11.
Review of 274 Cases of Lobar Pneumonia Treated with Sulfapyridine, with Analysis of Less Successful Responses. A. Caplan.—p. 16.
Incidence of Lead Poisoning Among Hindu Women and Children. K. N. Bagchi.—p. 23.
Chemotherapy in Plague. P. M. Wagle, S. S. Sakhay, B. B. Dikshit and K. Ganapathy.—p. 29.
Note on Dried Blood Plasma and Its Preparation in India. S. N. Hayes, J. N. Ray and N. N. Chopra.—p. 32.
Sedimentation Rate of Red Blood Cells in Epidemic Dropsy. C. L. Pasricha, K. S. Malik and S. Lal.—p. 34.
Biologic Control of Culicine Mosquitoes by Prawns in a Bengal Coo Mine. F. McCay and R. S. White.—p. 37.

Treatment of Hookworm Anemia.—Napier and his co-workers discuss 36 instances of microcytic hypochromic anemia for which hookworm infection was the only discoverable cause. The subjects were 32 men, 3 women and 1 child, all

Indian. The study of the effect of treatment on hookworm anemia was furthered because a number of the patients were being kept in the hospital for a considerable time—sometimes as long as three months—for investigating the efficacy of different anthelmintics. While in hookworm anemia little or no evidence of any reticulocyte response or increase of hemoglobin follows anthelmintic treatment, there is some retarding effect of the hookworm infection in response to iron therapy. This could hardly be accounted for by simple blood loss and suggests that the worms prevent proper absorption and/or utilization of dietary or medicinal iron. As gastric acidity was reduced in only a few instances, it seems unlikely that this accounts for any reductions in iron absorption. Diarrhea, a common complication of hookworm infection, may be evidence of mucosal dysfunction, or the failure of absorption may be dependent on the diarrhea, in which case the iron containing food rapidly passes through the part of the intestinal tract where absorption takes place. The authors feel that anthelmintic treatment without iron is of little immediate value. Even in extremely anemic patients usually the return of the hemoglobin level to normal can be achieved by treatment with iron alone, but this level will not be maintained unless the hookworms are eradicated. A slightly better response to iron treatment will be obtained after the worms are removed, but the difference is not justified by the risk of treating a patient with a low hemoglobin level only with anthelmintics. There was no evidence of a copper or manganese deficiency among the patients treated, and there appears to be no advantage in adding these metals to the medicinal iron. Grain for grain, ferrous ammonium sulfate in dextrose solution is a more efficient preparation than ferrous sulfate in tablet form. Two courses of treatment are usually sufficient to raise the hemoglobin level of an extremely anemic patient to normal; the courses consist of 18 grains (1.2 Gm.) of ferrous sulfate or 18 grains of crystalline ferrous ammonium sulfate in dextrose solution, daily in two or three doses, for three weeks. It is suggested that 4 cc. of tetrachlorethylene as an anthelmintic be given in the interval between the two courses of iron therapy. For mild infections, when only one course is likely to be necessary, the anthelmintic treatment can be given coincidentally with the iron. The authors' observations support the accepted theory that the anemia of hookworm infection is due mainly to loss of blood. They also indicate that some other minor factor is operative and that it is most probably the failure of absorption as a result of dysfunction of the intestinal mucosa.

Journal of Laryngology and Otology, London

56:1-34 (Jan.) 1941

Some Notes on Treatment of Carcinoma of Bronchus. F. C. Ormerod.—p. 1.

Mixed Parotid Tumor in Tonsillar Region. D. H. Craig.—p. 11.

Journal of Physiology, Cambridge

99:265-400 (March) 1941

Secretion of Urine by Newborn Infants. R. A. McCance and W. F. Young.—p. 265.

Blood Flow, Arterial Oxygen Saturation and Oxygen Consumption in Isolated Perfused Hindlimb of Dog. J. R. Pappenheimer.—p. 283.

Characteristics of Circulation of Hypertensive Rabbits. G. M. Brown and B. G. Maegraith.—p. 304.

Action of Acetylcholine, Eserine and Other Substances on Some Motor Responses of Central Nervous System. R. A. McKail, S. Obrador and W. C. Wilson.—p. 312.

Physiologic Study of Skin Resistance Response in Man. E. A. Carmichael, W. M. Honeyman, L. C. Kolb and W. K. Stewart.—p. 329.

Peripheral Conduction Rate in Sympathetic Nervous System of Man. E. A. Carmichael, W. M. Honeyman, L. C. Kolb and W. K. Stewart.—p. 338.

Inulin and Perabrodil Clearance After Alimentary Hemorrhage in Man. D. A. K. Black, J. F. Powell and A. F. Smith.—p. 344.

Movements of Unloaded Uterus. G. H. Bell.—p. 352.

Amine Oxidase in Sepia Officinalis. H. Blaschko.—p. 364.

Effect of Level of Inorganic Bases in Blood on Catabolism of Food Protein. I. Harris, J. T. Ireland and G. V. James.—p. 370.

Neuromuscular Transmission in Extrinsic Muscles of Eye. G. L. Brown and A. M. Harvey.—p. 379.

Lancet, London

1:371-406 (March 22) 1941

Delayed Collapse After Head Injury. D. Denny-Brown.—p. 371.

*Fluorine and Dental Caries. Dagmar Curjel Wilson.—p. 375.

*Chemotherapy in Experimental Gas Gangrene: Distribution of Drugs from Infected Wounds. G. B. Reed and J. H. Orr.—p. 376.

Prolactin as Specific Lactogenic Hormone. S. J. Folley and F. G. Young.—p. 380.

Fluorine and Dental Caries.—According to Wilson, records of 1,048 Somerset children from 5 to 16 years of age submitted to a statistical study indicate that the change in altered enamel caused by dental fluorosis is one factor preventing the breakdown in structure giving rise to dental caries. Of 122 children with no caries 66 had dental fluorosis, of 130 with one carious tooth the enamel of 28 was mottled, and the figures for 181 with two, 173 with three, 147 with four and 295 with five or more carious teeth were respectively 27, 12, 11 and 11. Thus an increased intake of fluorine before the completion of calcification appears to be associated with a relative immunity to caries. The loss of fluorine by the substitution of a highly milled and demineralized flour among communities formerly using coarsely ground cereal may have a bearing on the spread of dental caries among such peoples. With regard to the durability of mottled teeth, the author found that in England pyorrhea was common among men and women in the poorer rural communities irrespective of the presence of fluorine. When associated with mottled enamel the teeth that loosened were often not decayed. Among 90 rural housewives in Oxfordshire from 21 to 45 years of age, 19 had false teeth and 13 who showed mottled enamel had but a few carious teeth, while the remaining 58 gave no evidence of dental fluorosis but showed a considerable amount of decay.

Chemotherapy in Experimental Gas Gangrene.—Reed and Orr performed experiments on guinea pigs which show that for animals infected with *Clostridium welchii*, *Clostridium septicum*, *Clostridium sordellii* and *Clostridium novyi* oral treatment with sulfanilamide results in saving 25 per cent of the animals, whereas local treatment results in a saving of 55 per cent and combined local and oral treatment saves 44 per cent of the animals. The combined treatment caused a longer survival time of those guinea pigs which eventually died of the infection. The results with sulfapyridine and sulfamethylthiazole are similar but definitely superior to sulfanilamide in this respect. With sulfathiazole 87 per cent of the treated animals recovered and the remainder survived for much longer than the controls. In part, this results from the fact that sulfathiazole is highly effective in *Clostridium novyi* infections whereas sulfanilamide and sulfapyridine produce a slight increase in the survival time. Sulfathiazole is therefore the most effective of the four drugs and its local administration is superior to the oral. When sulfanilamide or sulfathiazole is introduced directly into an infected wound the concentration of the drug in the surrounding tissue is much higher than in the blood. No reasonable oral treatment will provide as high a concentration in the infected or potentially infected tissue as will result from local introduction. Despite the high concentration of the drug in the wounded tissue, leukocytic infiltration, phagocytosis and granulation proceed more rapidly than in untreated infected wounds. The method of administration which provides the highest concentration of the drug in infected or potentially infected tissue should be most efficient. This has proved to be the case in experimental gas gangrene.

Medical Journal of Australia, Sydney

1:405-434 (April 5) 1941

Insulin and "Cardiazol" in Treatment of Psychoses: I. Insulin Treatment. R. R. Webb.—p. 405.

Exophthalmos in Goiter. N. M. Harry.—p. 412.

Ear Picking and Eye Cleaning in the Middle and Far East. I. Brodsky.—p. 419.

1:435-466 (April 12) 1941

Insulin and "Cardiazol" in Treatment of Psychoses: II. "Cardiazol" Treatment. R. R. Webb.—p. 435.

Operative Treatment of Mastoiditis: Report on Work Done at the Royal North Shore Hospital of Sydney During the Period January 1930 to September 1940. E. P. Blaschki and A. L. Clowes.—p. 443.

New Type of Pavilion Ward for Sanatoriums. J. B. Ferguson and P. E. Everett.—p. 448.

Endemic Typhus in Papua. A. J. May.—p. 449.

Presse Médicale, Paris

49:41-64 (Jan. 15-18) 1941

Curable Tuberculous Splenopneumonia and Epituberculosis. J. Troisier and J. Le Melletier.—p. 41.

*Results Obtained with Interventions on Sympathetic in Frost Lesions. J. de Girardier.—p. 44.

Treatment of Frost Lesions.—Girardier discusses treatment of frost lesions on the basis of 34 cases of his own observation. He classes the patients in two groups. The first group comprises 18 patients with chilblains but without necrotic lesions, the symptoms being exclusively of the vasomotor type. The second group consists of 16 patients presenting necrotic ulcerations or with small areas of gangrene. The author stresses that frost bites should not be considered purely local lesions amenable to local therapeutic methods. All frost bites, even those without massive gangrene, should be considered as a vasomotor disorder whose evolution cannot be estimated immediately. The author advocates interventions on the sympathetic as the treatment of choice. Twenty-eight of his patients were subjected to this treatment. In 21 the lumbar sympathetic was infiltrated with procaine hydrochloride; 5 were subjected to femoral sympathectomy, and 2 to section of the lumbar sympathetic chain with ganglionectomy. Infiltration of the sympathetic has a cicatrizing effect on the frost bite ulcerations. The number of infiltrations varies with different patients. It is generally sufficient to give five infiltrations at intervals of two or three days. In some patients one or two are sufficient. Infiltrations are generally made on the side of the maximal lesion, or on both sides if the lesions are so located. The author injects 10 cc. of a 1 per cent solution of procaine hydrochloride without epinephrine. He regards injection of the lumbar sympathetic as the method of choice in the treatment of frost bite of the feet without necrotic lesions or with small ulcerations. Periarterial sympathectomy is indicated in necrotic ulcerations following sloughing of the scab stimulated by infiltrations, when the ulcerations are extensive, old or slow to cicatrize. Section of the lumbar chain with ganglionectomy is rarely indicated. It is limited to cases with pronounced bilateral circulatory disturbances whether these are accompanied by necrotic ulcerations or not. The author regards interventions on the sympathetic as a great advance in the treatment of frost lesions without massive gangrene.

Archivos Argentinos de Pediatría, Buenos Aires

15:79-200 (Feb.) 1941. Partial Index

*Frequency of Tuberculin Allergy in Children, P. Garrahan and R. Bagnati.—p. 79.

Tuberculin Allergy in Children.—Garrahan and Bagnati tested tuberculin allergy in two groups of children in 1918 and in 1938. The children, ranging in age from 2 years to 18, lived in asylums in Buenos Aires. The test consisted of an intradermal injection of 0.001 Gm. of tuberculin. When negative, the first injection was repeated or supplemented by an intradermal injection of 0.001 Gm. of tuberculin and a superficial subcutaneous injection of 0.001 Gm. of tuberculin. Positive results were obtained in 600 of 1,214 children in the 1918 series and in 454 of 1,444 in the 1938 series. They were obtained with the first tuberculin test in 466 of 600 children in the 1918 group and 255 of 466 in the 1938 group. Children with a positive reaction were placed in four groups, from 2 to 3, 6 to 7, 10 to 11 and 14 to 18 years of age respectively. The percentage of positive reactions for the 1918 series was 19, 45, 61 and 74 for the respective groups, and for the 1938 series 9, 25, 40 and 50. The results made it appear that the incidence of tuberculosis in children has diminished in the course of the past twenty years. From 1915 to 1919, there were admitted 19,618 children to the Hospital de Niños de Buenos Aires. Of these 933 had tuberculosis and 221 died from tuberculous meningitis. From 1935 to 1939, there were admitted 29,618 children, 548 of whom had tuberculosis and 136 died from tuberculous meningitis. These figures show a lowering of the incidence of tuberculosis from 4.8 per cent in a five year period from 1915 to 1919 to 1.8 per cent in the five year period from 1935 to 1939, and a lowering in the relative incidence of tuberculous meningitis from 11.1 per cent to 4.5 per cent. The lowered incidence of tuberculous meningitis in children is a

confirmation of the diminished incidence of tuberculosis in children. The fact indicates that primary tuberculous infection in children is less frequent now than it was twenty years ago. These observations support the belief expressed in the literature that primary tuberculous infection takes place more frequently now in early adult life than in childhood, adolescence and puberty.

Revista Neurológica de Buenos Aires

5:283-378 (Oct.-Dec.) 1940. Partial Index

*Spasmodic Quadriplegia with Familial Idiocy, Deafmutism; Cases. C. Jakob and A. Scaravelli.—p. 283.

Familial Spasmodic Quadriplegia, Deafmutism and Idiocy.—Jakob and Scaravelli report these abnormalities in a family of eight brothers and sisters. The parents are farmers of normal intellect and education for their social sphere. They are nonconsanguineous, nonsyphilitic and nonalcoholic. Some of the father's brothers had mental abnormalities and died unmarried. The normal brothers and sisters of the father had normal children. The family of the mother is normal. The couple had ten children, all of whom were of normal delivery. One of the children was apparently normal up to the age of 15 years, when she had an epileptic attack, fell from a horse and died. Another was apparently normal up to the age of 10 months, when he stopped growing and lived for twenty-three years in his cradle, an idiot. Another was an idiot with epilepsy from early childhood and died at the age of 16 years. Seven are living between the ages of 30 and 45. None of the children had meningitis in infancy or childhood. All have spasmodic quadriplegia, deafmutism, idiocy and epilepsy. Some crawl on their knees and some exhibit strabismus. The authors made an anatomic study of brains of human embryos and anatomopathologic studies of brains of cadavers of idiots with congenital spasmodic quadriplegia, epilepsy and mutism. The brains of idiots exhibited symmetrical tuberous dysplasia or hypoplasia of the Rolandic areas, symmetrical hypoplasia of the Rolandic, temporal and parietal areas and of the pyramids and corpus callosum and in some cases microgyria and pachygyria. The authors believe that these abnormalities are due to symmetrical lack of development of the Rolandic, parietal and temporal areas during the second and third months of embryonic development with consequent establishment of a condition of the nervous tissues which simulates corticostriatal tuberous sclerosis, early hypoplasia of the pyramids and corpus callosum and secondary hypoplasia of the parietal and frontal lobes. Heredity is a factor in the absence of other pathogenic factors. The existence of parallel recessive neurogenic defects in both parents is a plausible explanation of the abnormalities in the family reported by the author.

Chirurg, Berlin

12:629-660 (Nov. 1) 1940

*Surgical Treatment of Ulcerative Colitis. H. H. Westermann.—p. 629.
Results of Surgical Treatment in Fractures of Femur. H. Winkler.—p. 636.
Serotherapy of Peritonitis Following Perforative Appendicitis. W. Klemke.—p. 638.
Present Status of Plastic Surgery of Breast. W. H. Krause.—p. 642.
Technic of Surgical Therapy of Pendulous Breasts with Incision Totally Encircling Nipple. H. Kast.—p. 647.
Hypertrophy of Breast and Its Surgical Treatment. A. Nörden.—p. 650.

Surgical Treatment of Ulcerative Colitis.—Westermann points out that, while the treatment of ulcerative colitis is essentially medical, a number of cases will require surgical exclusion of the intestine. Appendicostomy, artificial anus at exclusion of the intestine. Appendicostomy, or the sigmoid ileum, cecum, transverse or descending colon, or the sigmoid have been suggested as means to put the intestine at rest. Appendicostomy was abandoned because it permitted irrigation but not evacuation of feces. Colostomy utilizing the descending colon was frequently resorted to because the disease was localized chiefly in the sigmoid and rectum, but it necessitated a double-barreled artificial anus and could be effective only if the segments above it were healthy. Roentgenograms revealed that an exclusion in order to be successful had to be made higher up, and that even an artificial anus of the transverse colon is not quite high enough. A cecal fistula likewise is not entirely adequate, except when prolapse of the small intestine

took place and feces could be evacuated from it. The ileac anus evacuates thin fluid feces which may injure the skin, but it alone guarantees complete exclusion of the large intestine. Following a pararectal incision on the right side, the lower part of the ileum is drawn forward and is divided between the clamp rows of a sewing machine suture from 15 to 20 cm. above Bauhin's valve. The oral part of the intestine is sutured to the peritoneum in the lower angle of the wound, and the aboral end in the upper angle. The oral portion of the intestine remains closed for from twenty-four to forty-eight hours until firm peritoneal adhesions have formed. The distal portion of the intestine can be opened at once and an irrigation tube inserted. The fistula can be used immediately and the entire colon cleansed of fecal remnants and sanguinopurulent discharges. The subjective condition of the patient rapidly improves, and the tormenting tenesmus subsides. Bleeding and mucous discharge subside. The operation has the advantage of safety and simplicity. The later removal of the anus and the anastomosis of the intestinal ends is comparatively simple. The old scar is excised with the diathermy knife; the artificial anus is temporarily closed and the abdominal cavity opened. The excised piece of skin with the two closed intestinal openings can be easily exteriorized, making an aseptic operation possible. After the loops of the small intestine have been severed from the skin, either end to end or side to side anastomosis can be made. Since complete sterilization of the skin is impossible in the region of the artificial anus, only the peritoneum and fascia are sutured; the subcutaneous tissue and the skin are loosely packed and left to heal by granulation. Bland diet is essential during the postoperative treatment. Constipation should be corrected by oil enemas or by oral administration of liquid petrolatum. The treatment requires a long time. The artificial anus cannot always be removed in the course of a year; occasionally the immobilization of the intestine must be continued for several years, but the favorable results justify the sacrifices involved. The author employed this treatment in numerous cases, and in all but a few normal evacuation of feces was reestablished. Hemicolectomy on the left side with its high mortality rate is made unnecessary by this treatment.

Deutsche Zeitschrift für Chirurgie, Berlin

254:73-212 (Oct. 19) 1940. Partial Index

- Blood Transfusions. J. Clemens.—p. 73.
Stenosis-Inducing Syphilis of Stomach in Girl with Congenital Syphilis: Case. H.-W. Voigt.—p. 91.
*Thymus Involvement in Myasthenia Gravis Pseudoparalytica. C. Bomskov and G. Milzner.—p. 99.
Heredity and the Triad of Typical Symptoms in Osteogenesis Imperfecta. Tarda. K. Bornbusch.—p. 115.
Connection Between Spondylitis Tuberculosis and Urogenital Tuberculosis. R. Hemprich.—p. 181.

Thymus Involvement in Myasthenia Gravis.—Bomskov and Milzner investigated Adler's theory of thymus involvement in myasthenia by experimenting on some 120 rats and 30 guinea pigs both with the specific thymus hormone as well as with extracts prepared according to Adler's method. They arrived at the conclusion that if the endocrine system is involved it is not the thymus but the adrenal cortex whose impairment is primarily responsible for all myasthenic phenomena. Myasthenia is defined as abnormal muscular fatigue, demonstrable in spontaneous movements and on electrical stimulation. Anatomically nonspecific, so-called lymphocytic infiltrations are most frequently found in the muscles. According to Adler, the implantation of dog or calf thymus glands in dogs, the administration of certain thymus extracts and the injection of myasthenic human blood provoke grave myasthenia causing complete prostration in some dogs. Adler also holds the view that myasthenia observed in exophthalmic goiter and adynamia observed in Addison's disease is true myasthenia, since Jolly's reaction is positive and prostigmine bromide effects prompt amelioration. The authors in their experiments employed the specific thymus hormone and the extracts prepared according to Adler's formula in very high concentrations. Rats and guinea pigs were used instead of dogs because adrenalectomy regularly induces a typical adynamia in these animals and thus makes them excellent material for cortical hormone experiments. In no case were the authors able by either method to induce myasthenic reactions. The authors

believe that the discrepancy between Adler's and their results is due in part to the inadequacy of Adler's procedure. Several of his dogs died of pneumonia shortly after the test; abscesses were also observed after implantation. However, the crux of the experiments for them lies in the fact that Adler was unable, in spite of prolonged injections of thymus extract, to induce the clinical phenomenon of fatigue, specific for myasthenia. Adler, they think, also overestimated the diagnostic value of Jolly's reaction, for he found myasthenia associated with numerous cases of exophthalmic goiter, far transcending the observations of all other investigators. The authors do not believe that there is any primary connection between myasthenia and the thymus gland.

Klinische Wochenschrift, Berlin

19:1225-1248 (Nov. 30) 1940. Partial Index

- Bases and Development of Antitoxic Serum Therapy. R. Prigge.—p. 1225.
*Serodiagnosis of Tuberculosis in Its Significance for Differential Diagnosis of Silirosis Associated with Pulmonary Tuberculosis. W. Heine.—p. 1227.
Acromegaly and Lactation in Male. M. Staemmler.—p. 1231.
Effect of Short Waves on Tissue Cultures. E. Hasché.—p. 1233.
Method for Quantitative Determination of Thiamine Hydrochloride by Means of Pulfrich Photometer: Criticism of Tolerance Test. F. Pezold and E. Dittmar.—p. 1234.
Behavior of QT Interval in Three Derivations of Human Electrocardiogram. A. Huttman.—p. 1237.
Injection of Theobromine with Sodium Salicylate in Angina Pectoris. I. von Gónczy and A. Pilser.—p. 1239.

Serodiagnosis of Tuberculosis Associated with Silirosis.—Heine presents investigations on the diagnostic and differential diagnostic significance of serologic tests for tuberculosis in cases of pneumoconiosis associated with tuberculosis. Whereas clinical and roentgenologic examinations disclosed the simultaneous existence of a tuberculous pulmonary process in 103 of 178 cases of pneumoconiosis, microbiologic examination demonstrated tubercle bacilli in the sputum in all 178 cases and thus proved that the associated pulmonary process was of tuberculous etiology. The serologic tests likewise gave interesting information, the specific antibodies being demonstrable in 176 out of 178 cases. The serologic tests have the advantage of permitting clarification of the etiology of an obscure pulmonary disorder long in advance of the culture method of the animal test. The author reviewed 163 cases of pneumoconiosis in many of which neither microscopic nor culture study demonstrated tubercle bacilli in the sputum, or in which only serum was available for examination. Serologic tests revealed the presence of antibodies against tubercle bacilli in 93 cases and thus made it possible either to corroborate the clinical diagnosis or to point out to the clinician the existence of a specific pulmonary disorder. In nearly all cases in which the serologic tests had indicated tuberculosis, either the clinical methods or the demonstration of tubercle bacilli in the sputum corroborated within a year the correctness of the serologic method. The author concludes that serologic tests for tuberculosis are of great diagnostic and differential diagnostic value, especially in cases in which tuberculosis is combined with pneumoconiosis.

Wiener klinische Wochenschrift, Vienna

53:1021-1046 (Dec. 13) 1940

- *Therapy of Lupus Vulgaris with Gold and Specific Convalescent Serum. E. Neuber.—p. 1021.
*Pulmonary Tuberculosis and Asthma. W. Neumann.—p. 1024.
Diagnosis of Patent Ductus Arteriosus Botalli. E. Lewicki.—p. 1029.
Effect of Riboflavin on Glycogen in Liver and Muscle and on Insulin Hypoglycemia. H. Spitzbarth.—p. 1031.

Therapy of Lupus Vulgaris.—According to Neuber, evidence is available that endogenic, particularly hematogenic, infection plays the most important part in the pathogenesis of tuberculosis of the skin. For this reason excision or any other form of eradication of the local lesion is justified only if the process is primary and is limited to one site. The treatment of lupus by roentgen rays, surgical measures or medicinal measures is a therapeutic error if tuberculosis has not been searched for in other parts of the body. The author found tuberculin therapy unsatisfactory and at times involving hazards. He therefore decided to try a milder specific procedure, convalescent serum. He obtained serum from persons whose tuberculosis had been cured or at least had become inactive. He reports the history of a girl aged 13 with lupus lesions on

the right hand and elbow. During the time from March 21 to July 1, 1939 she was given a total dose of 1.4 Gm. of a gold preparation and nine intragluteal injections of convalescent serum. The medication with the gold preparation was begun with great caution. The doses were gradually increased from an initial dose of 0.01 Gm. Injections of the gold preparation were given at five day intervals and the convalescent serum was administered in quantities of from 10 to 20 cc. on the intervening days. This combined therapy was followed by disappearance of the lupus lesions and smooth unpigmented scars. This favorable cosmetic result is the more important because lupus lesions occur frequently on the face. The author admits that so far he has used this treatment on only a few patients but states that these few were completely cured. He gained the impression that the gold treatment prepares and sensitizes the disease process for the specific action of the convalescent serum.

Pulmonary Tuberculosis and Asthma.—Neumann points out that patients with pulmonary tuberculosis often present respiratory difficulties such as air hunger, cyanosis, prolongation of expiration, whistling and buzzing rales, but not necessarily a true asthma. These disturbances can be brought on by conditions that complicate pulmonary tuberculosis such as Schmorl's deforming bronchitis, displacement of the mediastinum, deviation of the trachea and of the main bronchi, emphysema, pleural adhesions and bronchospasms. Opinions are divided as to types of tuberculosis in which this form of asthma occurs and as to whether a true allergic asthma can be brought on by a tuberculous process. Many assume that asthma is nearly always of tuberculous origin, because of the concurrence with a history of tuberculosis and the efficacy of tuberculin therapy. Other observers maintain that tuberculosis and asthma are mutually exclusive, while a third group adhere to tuberculin therapy as an important weapon against bronchial asthma. The author believes that these opinions can be bridged. The differences are based on the conception of tuberculosis. If by tuberculosis is understood an ulcerative process or an infiltrative process and a positive sputum, then it can be said that this form of tuberculosis and asthma exclude each other. The problem assumes an entirely different aspect if the definition of tuberculosis is made more inclusive. If clinical changes such as pleural adhesions, early development of emphysema, enlargement of the spleen and positive allergy are considered as indicative of a subsiding mild hematogenic dissemination, those authors are correct who assert that practically every case of asthma is brought on by tuberculosis. At present the percentage of asthma cases caused by endogenous tubercle bacillus allergens and the percentage of cases which in the presence of tuberculosis are caused by parallelism and metallurgy (Urbach) or by heteroallergy cannot be definitely ascertained. In most of the cases observed by the author, exogenous allergens played an important part. A purely tuberculous endogenous allergy was responsible in only about one fourth of the cases. The author believes that systematic tuberculin therapy will produce favorable results in the majority of cases. Specific desensitization is usually difficult, since more and more allergens become active, the longer the allergosis exists, so that the originally univalent allergic disease becomes polyvalent and it is no longer possible to keep all offensive agents away from the patient.

Zeitschrift für klinische Medizin, Berlin

138:155-276 (Sept. 19) 1940. Partial Index

- *Pathogenesis of Familial Hemolytic Anemia. J. von Boros and G. László.—p. 155.
Blood Diastase. M. Güllow.—p. 177.
Causes of Impairment of Circulatory Condition in Rheumatic Heart Diseases. H. Bennewitz.—p. 231.
Meteorotropism of Pulmonary Embolism. H. Raettig and E. Nehls.—p. 242.
Does Creatinuria Influence the Galactose Metabolism? T. von Uexküll.—p. 269.

Familial Hemolytic Anemia.—Von Boros and László report studies on 7 patients with hemolytic icterus, in 4 of whom the disorder was familial. They also made investigations on 8 other clinically healthy subjects who had a tendency to hemolysis. On the basis of their observations the authors

regard microspherocytosis not as a primary hereditary characteristic but rather as a pathologic regenerative type. Microcytosis and relative macrovolumina were especially pronounced in cases in which regeneration was especially brisk. Microspherocytosis was hardly noticeable during the latent period of the disorder and was entirely absent in some persons with a hemolytic constitution. The microspherocytosis generally ran parallel to the intensity of the regeneration. It was strongest several days after hemolytic crisis. In one instance the microspherocytosis was increased several days after the removal of the spleen and later gradually subsided. Microspherocytosis is not an exclusive characteristic of hemolytic icterus; it occurs also in posthemorrhagic anemias. The resistance of the erythrocytes is not dependent on the size and thickness of the cell. The decrease in resistance is not caused by the shape but by changes in the colloidal structure of the cell stroma. This structural change is to be seen in the change of ratio between the different lipoids in the serum and in the erythrocytes. The quotient serum lecithin/serum cholesterol was found to be above normal in every case. It has not been explained what causes this change in ratio. Since in 1 case the ratio became normal after splenectomy, the authors assume hormonal influences of the spleen.

Zeitschrift für urologische Chirurgie, Berlin

45:305-400 (Oct. 30) 1940

- *Grawitz Tumors and Related Tumors of Kidney: Microscopic Study. W. Wepler.—p. 305.
Equipment and Management of Department for Urologic Examination and Treatment. J. Keller.—p. 390.

Grawitz Tumors and Related Tumors of Kidney.—Wepler points out in an extensive review on the Grawitz and related renal tumors that when Grawitz, sixty years ago, advanced his theory of hypernephroid genesis of these tumors, which theretofore were believed to be heteroplastic lipomas, most pathologists believed that the problem of these tumors had been solved. The author's observations reveal that the morphologic aspects of these tumors vary so greatly as to make a definite diagnosis impossible in a number of instances. Added to this difficulty is the multiformity of renal tumors resembling the hypernephroid. The author studied twenty-eight tumors which came under the collective term of Grawitz tumors, five carcinomas, nine embryonal adenocarcinomas and forty adenomas. He believes that renal cancers and Grawitz tumors represent a genetic unit. The microscopic features on which he bases this conclusion are the close relationship of the tumor parenchyma to the delicate vascularized stroma and the tendency to vacuolation, to hemorrhage and to fat storage. Purely epithelial, as well as Grawitz tumor-like and sarcoma-like forms, can be traced to various differentiations of the cells of the matrix. The forms with spindle-shaped cells which resemble sarcoma are consequently not real sarcomas (tumors of the mesenchyma) but rather meristomas, or tumors which have remained in the embryonal stage of development. Renal cancers as well as Grawitz tumors are at first solid. Their alveolar-columnar structure is the result of the simultaneous and closely linked growth of parenchyma and stroma. Attention is called to the dysontogenetic renal tumors of von Hippel-Lindau's hamartosis, which are closely related to the mesenchyma and do not permit a definite differentiation from the tumors discussed here. The formations usually referred to as glands, cysts or villi in Grawitz tumors differ noticeably from such formations in tumors of different localization. In the majority of cases they are gaps resulting from cellular disintegration. Primary gap formation is only occasionally observed. Hemorrhages are frequent in all the described tumors. They penetrate into already existing hollow spaces or burrow into solid parenchyma but usually spare the stroma. Since the tumor cells attached to the vessels or to other parts of the stroma are almost never destroyed, even in the presence of extensive hemorrhages, cavernoma-like formations are often seen in which the walls of the hollow spaces are lined with several layers of parenchyma cells. The author rejects the term angio-epithelioma as unjustified for these essentially Grawitz tumors, which differ from the ordinary Grawitz tumor

by the extensive hemorrhages, a difference of degree and not of essentials. He differentiates between renal cancers, renal cancers of the Grawitz type, and Grawitz tumors in the more restricted sense. The latter are benign, small-cell tumors, the cells containing granulated or lipoferous protoplasm. Puh's idea that Grawitz tumors are reticuloendotheliomas is rejected as untenable. The original solid structure, the formation of gaps brought on by cell disintegration and hemorrhage, the clear separation between tumor parenchyma and the stroma vessels lined with unchanged epithelium contradict the diagnosis of a vascular tumor. Grawitz tumors are not hypernephrogenic. Differentiation of the various forms from the same matrix also contradicts Lubarsch's theory of a mixed tumor (nephrogenic plus hypernephrogenic). There is no definite proof of the histogenetic matrix, but the author suggests that it represents the later growth of embryonal tumor buds from the meta-nephrogenic blastema, in which defective tissue differentiation plays the decisive role.

Folia Pharmacologica Japonica, Kyoto

31:1-119 (Jan. 20) 1941. Partial Index

*Effect of Quinine Derivatives on Growth Rate of Fujinawa Rat Sarcoma in Tissue Culture. N. Sofue.—p. 1.

Quinine and Growth of Rat Sarcoma.—Sofue endeavored to ascertain the effect of quinine derivatives on the growth rate of rat sarcoma cells (Fujinawa strain) in tissue cultures. A total of twenty-three derivatives of quinine, added to the special culture medium containing no muscle or other tissues, were tested in varying concentration (1,200, 2,400, 3,600, 4,800 and 6,000 molar). The potency of each drug was estimated from the minimal concentration necessary to inhibit completely the growth of the sarcoma cells; the finer differences in potency were calculated from the relative growth index in the preparation just below the level of the minimal inhibitory concentration. All twenty-three of the derivatives of quinine used in the experiments displayed a growth-inhibiting influence on sarcoma cells in tissue culture. This effect appeared to increase in parallel with the number of carbon atoms in the side chain at the 6 position of the quinoline ring; the inhibition was approximately similar with cinchonine, cupreine and quinine, much more marked with ethyl apoquinine and most pronounced of all with eucupine and vuzin. The quinine derivatives were found in the change of the vinyl radical at the 5 position in the quinuclidine nucleus of the molecule, the inhibitory power increasing in the following order: ethyl, vinyl, halogen ethyl and dihalogen ethyl, where iodine was the most effective and chlorine the least inhibitory. The effect was less pronounced in the cupreine derivatives and almost absent in the cinchonine derivatives; and in the ethyl apoquinine derivatives the effect was reversed.

Mitt. a. d. med. Akad. zu Kyoto, Kyoto

31:1-398 (Jan.) 1941. Partial Index

*Experimental Study of Maximal Fever Therapy. K. Wakabayashi.—p. 57.

Maximal Fever Therapy.—Wakabayashi endeavored to study the mechanism involved in the effect of fever therapy by using various fever-inducing agents such as bacterial vaccines and certain chemicals. The effect of temperature varying between 37 and 41 C. on the growth of gonococci on cystin-saccharose-blood nutrient mediums was found to be negligible up to five hours, but thereafter such temperatures increased the death rate of the organisms. The addition to the culture mediums of antigonococcus silver preparations greatly decreased the resistance of the organisms against heat. The comparative studies of blood pictures following various types of fever therapy (vaccine injections and administration of sulfur preparations) indicated that sulfur is the most satisfactory agent in that it produced no appreciable changes in the blood picture, and the duration of fever was constant. Gonococcus vaccine, however, proved to be effective in stimulating the functions of hemopoietic organs, the reticuloendothelial system and phagocytosis; thus fever therapy as induced by the injection of gonococcus vaccine

differs essentially from the so-called stimulation threshold therapy of Zimmer in that it is more in line with the panenergetic reaction of Mulzer and Keining. According to the latter authors there are three phases of the reaction induced by stimulation, namely (1) the phase of stimulation threshold, (2) the phase of provocation and (3) the panenergetic phase. The first and the last phases are favorable for therapeutic effect, while the second is unfavorable. The author agrees with the opinion of Weichardt that the principle of omnicellular activation is the fundamental mechanism involved in the therapeutic effect of fever therapy.

Klinicheskaya Meditsina, Moscow

18:1-156 (No. 9) 1940. Partial Index

Pathogenesis of Pernicious and Botriocephalus Anemia. G. F. Lang.—p. 3.

Myocarditis, Myocardial Dystrophy and Cardiosclerosis in Light of Experimental Morphology. Ya. L. Rapoport.—p. 23.

*Nature of Pain in High Flights. V. V. Streltsov.—p. 42.

Partial and Complete Anoxemia of the Myocardium. M. Ya. Aryev, E. P. Kartseva and T. K. Vorobyeva.—p. 53.

The Nature of Pain in High Flights.—Streltsov calls attention to joint and muscle pain which develops when one is flying more than 10 kilometers above the sea level. The pathogenesis of this pain has not been elucidated. Haldane in 1909 suggested the possibility of caisson disease developing in rapid ascent to high levels. Benzinger called attention, in this connection, to the appearance of nitrogen bubbles in the cerebrospinal fluid as suggestive of increased intracranial pressure. The nervous tissue is first to undergo nitrogen desaturation because it consists chiefly of lipids, and nitrogen is more easily soluble in fats under the condition of lowered barometric pressure. Pain may be due to escape of nitrogen from nerve trunks or brain tissue. The pain may be of traumatic origin, since nitrogen bubbles are capable of tearing tissue or of exerting pressure on nerve trunks. Haldane made the observation that the brain of animals subjected to rapid decompression appears to be pierced by numerous bubbles, giving it a vacuolated appearance. The author studied the subject of joint pain under the conditions of the low pressure chamber. Of 800 men subjected to barometric pressure of 197 mm. and less, which corresponds to height levels of from 10 to 14.5 kilometers, 55 (about 7 per cent) complained of joint pains. In personal experiments the author had noted that pain was first experienced in the small joints of the extremities and later in the large joints (shoulder, elbow, knee). A characteristic feature of the pain is its disappearance when the barometric pressure is increased. The pain as a rule disappears with the descent to levels below 10 kilometers. The author was not able to establish any relationship between the development of the joint pain and the amount of oxygen inhaled. He stresses the importance of differentiating changes resulting from anoxemia from those due to the direct effect of lowered barometric pressure. He found that rabbits taken up in flights to 10 and 11 kilometers without oxygen supply died and exhibited post mortem pulmonary emphysema, hyperemia and hemorrhages into the lungs and intestinal mucosa, and gas emboli in the large vessels and in the coronary vessels of the heart. Another factor of importance noted in lowered barometric pressure is the loss of body temperature. The appearance of gas emboli and bubbles in the brain tissue is explained by loss of nitrogen, which, according to the Dalton-Henry law, passes, in a condition of lowered partial pressure, from a soluble state to a gaseous state. Oxygen inhalation was suggested as prophylaxis before going on a flight. Theoretically, this should have the effect of lowering the partial pressure of nitrogen in the lungs, which in turn should lower its tension in the blood. This measure was effective in preventing caisson disease in divers. Prophylactic inhalation of oxygen for twenty minutes to three hours, followed by a rapid rise to from 10 to 14 kilometers, failed to have any effect on the development of the joint pain. The author likewise suggests that the origin of the pain may be sought in moderate or imperceptible anoxemia, such as takes place at moderate heights without oxygen inhalation or at great heights with oxygen inhalation. He thinks that this mild anoxemia is

capable of disturbing the functional relationship between the cortex of the brain and the subcortical tissue, with resulting imbalance between the stimulating and the inhibitory impulses. Such an imbalance may lead to increased sensitivity of the painful influences arising in the joints. The author regards the onset of joint pain as a danger signal signifying the approaching failure of compensatory physiologic mechanisms and requiring immediate descent to levels of higher atmospheric pressure.

Vestnik Oftalmologii, Moscow

17:511-696 (No. 5) 1940. Partial Index

Osmotherapy for High Grade Myopia Without Changes in the Macula. V. P. Filatov and A. E. Volokitenko.—p. 515.

Study of Retinal Edema by Measuring Alterations in the Electrical Sensitivity of the Eye. A. Ya. Samoylov, N. T. Fedorov and V. G. Davydov.—p. 519.

Ophthalmodynamometry in Study of Retinal Circulation. N. O. Sag.—p. 533.

*Experimental Transplantation of Dried and Frozen Cornea. V. P. Filatov and M. A. Bazhenova.—p. 536.

*Transplantation of Conserved Cadaver Cornea. S. E. Sharts.—p. 543.

Experimental Transplantation of Dried and Frozen Cornea.—Filatov and Bazhenova found in their work on tissue cultures that conservation of excised cornea is preferable to conservation of the whole enucleated eye. The former method demonstrated the particular resistance of the cornea to drying and freezing. Temperatures of from $+2$ to -3 C. and desiccation to the extent of loss of from 15 to 20 per cent of the original weight were least injurious to corneal explants. To demonstrate the possibility of obtaining a translucent take, Bazhenova practiced keratoplasty on 8 rabbits utilizing Filatov's technic. The corneal tissue to be transplanted was removed from the refrigerator and was kept at room temperature for one half to one hour. Following the preparation of a conjunctival ribbon, the transplant was rendered moist by passage through three or four Petri dishes containing Ringer's solution. The washed tissue was placed, epithelial surface down, on a highly polished ebony plate and the required size excised by means of a trephine and transferred to the eye of the recipient. The authors had obtained five translucent and three semitranslucent takes.

Transplantation of Conserved Cadaver Cornea.—Sharts reports 30 cases in which keratoplasty utilizing preserved cadaver cornea was performed. The corneal tissue was conserved for from four hours to six days at a temperature of from 2 to 4 C. In 3 of the cases corneal opacity was due to parenchymatous keratitis, in 15 to healed ulcerative processes, in 5 to burns and in 6 to undetermined causes. The author concludes that, while the operation of keratoplasty is not a complicated one, the after-care calls for much attention and awareness of certain complications. He stresses the necessity of a long follow-up, because improvement or deterioration in both the state of the transplant and the acuity of vision are to be noted long after the operation. While all thirty transplants took, careful slit lamp observation did not reveal even one completely translucent transplant. Prolonged observation revealed that the corneal tissue about the transplant had a tendency to become translucent. Some improvement in vision was noted in 18, but good vision resulted in only 2. Because of the tendency to glaucoma, a prophylactic iridectomy is indicated in all instances in which there is a predisposition to glaucoma. Keratoplasty will give satisfactory results in glaucoma provided it is preceded by an iridectomy.

Ugeskrift for Læger, Copenhagen

102:411-436 (April 25) 1940

Experiences with Avertin Anesthesia. A. Langvad-Nielsen.—p. 411.

Significance of Diaphragm in Respiration. U. Gad.—p. 416.

*Studies on Pathogenesis of Epileptic Attacks. A. Faurbye.—p. 419.

Pathogenesis of Epileptic Attacks.—Faurbye states that the spasm threshold determines the development of spasms. Alkalosis, hyperhydration, hypoxemia, hyperleucithinemia and hypoglycemia increase the frequency of attacks in all cases of epilepsy by increasing the irritability of the nervous system. The complex spasm threshold is made up of these factors and several others. In some cases one factor is of special significance, in other cases another; in some it is perhaps a single

factor, in others it is several factors simultaneously. In a group of cases in which daily spontaneous absences occurred the author found the most important factor to be the reaction of the blood, particularly the alteration of the reaction in an alkaline direction, and in two patients the intracranial pressure plus an unknown factor influenced by insulin was especially significant.

102:619-650 (June 13) 1940. Partial Index

Review of New Chemotherapeutics in Sulfanilamide Group. A. Eldahl.—p. 619.

*Hemorrhagic Diathesis in Newborn, Especially with Regard to Treatment with Blood Transfusion. P. N. Damm.—p. 620.

Hemorrhagic Diathesis in Newborn.—Damm reports nineteen cases of hemorrhagic diathesis in the newborn. There was no relation between the disorder and the sex or degree of development or complications at birth. The cause is a reduction of the prothrombin in the blood, probably due to avitaminosis K. Hemorrhages from the gastrointestinal tract are most frequent and generally benign, while the less common umbilical hemorrhages often have a violent course. The symptoms of the hemorrhagic diathesis usually appear two or three days after birth and seldom last more than two days. One of the three cases of hemorrhage from the umbilicus was fatal in spite of energetic local treatment and intramuscular injection of blood; in the other two cases, in which local treatment also proved ineffective, immediate recovery followed transfusion of blood through the longitudinal sinus. Immediate sinus transfusion is advised in the more grave cases of hemorrhagic diathesis in the newborn, especially in cases of umbilical hemorrhage, with supplementary treatment with vitamin K if possible.

102:773-796 (July 25) 1940. Partial Index

Listerella Monocytogenes, Its Significance in Human and in Veterinary Medicine. A. Nyfeldt.—p. 773.

*Treatment of Infectious Mononucleosis with Specific Convalescent Serum. H. C. A. Lassen and S. Thomsen.—p. 774.

*Effect of Sulfanilamide on Infectious Mononucleosis. S. Thomsen.—p. 779.

Treatment of Infectious Mononucleosis with Specific Convalescent Serum.—Reviewing the recent knowledge on infectious mononucleosis, Lassen and Thomsen state that the mortality from this disease amounts to about 1 per cent. They compare the results of treatment of 12 severe cases with specific convalescent serum with the outcome in 15 severe untreated cases, 50 cases treated with nonspecific serum and 27 cases treated with neoarsphenamine injections. The treatment with specific convalescent serum in doses of from 60 to 300 cc. intravenously brought rapid improvement in the general condition, more rapid fall of the temperature to normal and a marked subjective feeling of improvement, usually in the course of from one to two days after the injection.

Effect of Sulfanilamide on Infectious Mononucleosis.—Thomsen compares the results of treating 31 cases of infectious mononucleosis with sulfanilamide with the course of the disease in 50 similar cases in which no causal therapy was tried. He says that apparently the sulfanilamide treatment may shorten the course somewhat, but the difference in the cases observed was not enough to warrant definite conclusions. On microscopic examination of tonsils removed either at necropsy or by tonsillectomy he found the throat disorder in infectious mononucleosis to be largely due to mixed infection from the oral cavity by bacteria which invade the tonsils already greatly altered by the primary disease. The infection causes a general purulent inflammation of tonsils which often results in abscesses and necrosis. This inflammation is essentially different from the mononuclear hyperplasia due to the primary infection. The apparent effect of the sulfanilamide may result from an action on this secondary mixed infection, not from any action on the primary mononuclear infection. Three cases are described in which combined treatment with sulfanilamide and specific convalescent serum was given with resulting rapid drop in the temperature and speedy disappearance of the symptoms.

Book Notices

Practical Clinical Psychiatry. By Edward A. Strecker, A.M., Sc.D., M.D., Professor of Psychiatry and Chairman of the Department of Psychiatry, School of Medicine, University of Pennsylvania, Philadelphia, and Franklin G. Ebaugh, A.B., M.D., Professor of Psychiatry, University of Colorado Medical School, Denver. Section on Psychopathological Problems of Childhood. By Leo Kanner, M.D., Associate Professor of Psychiatry, Johns Hopkins University School of Medicine, Baltimore. Fifth edition. Cloth. Price, \$5. Pp. 728, with 57 illustrations. Philadelphia: Blakiston Company, 1940.

This work is written from the point of view which regards mental disease in terms of psychodynamics. The interplay of soma and psyche throughout the life history of the individual patient is emphasized, and mental disorders are considered as impairments in the individual's ability to resist the stresses and strains to which his environment subjects him. The factors which may predispose an individual to mental disease are considered, but the authors regard these of lesser significance as causative than as precipitating factors which exist in the environment.

The authors recommend graphic methods of recording the progress of abnormalities in the patient and urge autobiographic studies of personality as useful tools for the student of psychiatry. Three major categories for the classification of psychoses are proposed: the organic, the toxic and the psychogenic or functional. That functional disorders may be masked by superimposed organic or toxic conditions is pointed out. Adolf Meyer's classification of seven reaction types of patients suffering from mental disease is suggested as preferable to the more static conceptions. However, Meyer's classification is merely mentioned, and the actual definition of the various psychoses is done in the traditional way.

The methods of the psychiatric examination are described at considerable length and include (1) taking of the patient's history, (2) the interview with the patient, (3) the physical and neurologic examinations and (4) the laboratory examinations. It is suggested that these procedures be supplemented by the use of special techniques such as the Rorschach test and the "amylal interview."

In dealing with the psychoneuroses the authors emphasize Myerson's point of view that organic aspects must not be neglected because psychogenic factors appear to be primary causative agents. At Pennsylvania Hospital one third of the patients of the outpatient neuropsychiatric clinic had evidence of definite somatic disease along with their neuroses. The importance of the neuroses cannot be overestimated in spite of their low numerical incidence in the populations of mental hospitals, since these patients fill the offices and clinics of the psychiatrists. The authors believe that the exigencies of modern civilization represent the protest of the individual against the stereotypy of the mass. Hence the more complex our civilization becomes, it is inferred, the more prevalent the neuroses. Methods of psychotherapy with the neurotic are outlined. These include establishing rapport between physician and patient, ventilation of the conflict material and desensitization (a gradual process whereby the patient comes to grips with his fears and learns to overcome his fear reactions) and reeducation of the patient by giving him insight into his illness and teaching him to build up new habits. In addition, it is suggested that therapy in many cases necessitates the desensitization of the patient's family to his illness and the family's reeducation in attitudes toward the patient.

The volume contains a chapter by Dr. Leo Kanner of Johns Hopkins University on the psychopathologic problems of childhood. The history of the mental hygiene movement is briefly traced, as well as the growth of clinics for child study. Case studies illustrating various problems in children are presented. The work concludes with an excellent glossary, which will be valuable to the medical student in psychiatry as well as to the psychologist, and it has an excellent index. This edition of a standard textbook in psychiatry has been brought completely up to date not only in factual material but in the underlying point of view, with special emphasis on "the patient as a person," demonstrated by hundreds of case studies, and the interplay of organic and environmental factors in the dynamic progression of abnormalities of personality which eventually produce mental disease.

Manual of Applied Nutrition, The Johns Hopkins Hospital. Paper. Price, \$1. Pp. 86. Baltimore, 1941.

This little paper bound manual has been compiled as a guide for dietary treatment in the Johns Hopkins Hospital. Only general instructions are provided because it is emphasized that the success of dietary therapy depends on the daily food supply meeting the individual requirements of the patients. Brief data are provided on the composition of normal, regular and liquid diets, including a liquid diet without milk, cocoa or grape juice. Directions are provided for the general scheme of a soft diet and for high vitamin and high calory diets. Suggestions for therapeutic diets to be used in the treatment of typhoid, cardiac disorders, gastrointestinal conditions and diseases of the liver and gallbladder are also provided. A brief summary of the requirements for a diabetic diet and various low calory and ketogenic diets are given. Suggestions are offered about diets in pregnancy and lactation, the toxemia of pregnancy, in the anemias, arthritis, gout, food allergy and hypertension. Diets for children are also included, and various test diets such as that of Wilder for use in suspected Addison's disease. The value of the booklet is enhanced by the inclusion of weight, height and age charts for adults, boys and girls, and data on various physiologic constants including blood chemistry. The list of liver products available in the hospital pharmacy is included, as well as a list of vitamin preparations which are likewise available in the hospital. This valuable manual will be especially useful in the hospital for which it was designed; there are even included the extension telephone numbers of the different dietary departments in the hospital. A book of this kind doubtless will be well thumbed, and a more substantial binding would make it even more valuable.

The Cyclopedia of Medicine, Surgery and Specialties. George Morris Piersol, B.S., M.D., Editor-in-chief, and Edward L. Bortz, A.B., M.D., Assistant Editor. Chief Associate Editors: Eldridge L. Ellnson, A.B., M.D., P. Brooke Bland, M.D., Conrad Berens, M.D., Francis L. Lederer, B.S., M.D., and A. Graeme Mitchell, M.D. In Sixteen Volumes, Including Index Volume. Second edition. Cloth. Pp. 14,779, with illustrations. Philadelphia: F. A. Davis Company, 1940.

This encyclopedia has been known to the medical profession since 1932. The present edition represents a complete revision and rewriting of most of the material which appeared in the first set. That set was completed in 1935. The present work includes articles by eight hundred and seven physicians. Obviously there is collected here a mass of scientific material of varying quality. Fortunately, however, the selection of contributors has been good and the majority of the monographs are excellent. The discussion as to whether or not a loose-leaf system is preferable to a permanently bound system is perennial. No doubt there are good arguments on both sides and also good arguments against each type of publication. Unquestionably such a reference work is exceedingly useful to its possessor, and its ready availability in time of need is excellent insurance against emergencies.

Certain features of the cyclopedia are distinctive. The arrangements in two narrow columns, the use of varying types for outlining, the provision of bibliography and the excellence of the illustrations are worthy of mention. Especially important also is the extensive cross reference so that one who wishes to read exhaustively in any field is led thereby to all of the associated material. A special index aids rapid reference, and provision is made for the annual progress volume and the cumulative index which are supplied with this material. The experience of the editors and the associate editors, all of whom possess names of repute in scientific medical literature, is a further guaranty of the quality of the material in this system.

Tuberculothérapie dans les névralgies faciales idiopathiques et certaines affections essentielles. Investigation clinique. Par le Dr. Carlos Charlin C., professeur à la Faculté de médecine, Santiago (Chile). Préface du doyen de la Faculté de médecine. Prof. A. Larraguibel. Paper. Pp. 336, with 33 illustrations. Santiago: Nascimento, 1940.

The author calls attention to the seriousness of facial neuralgia and how physicians have often resorted to such treatment as injections of the nerves with alcohol and the administration of morphine, and how suicide has not been uncommon among persons suffering from this condition. Dr. Charlin is of the opinion that idiopathic facial neuralgias are frequently due to

tuberculosis. He was led to this belief because he found that 95 per cent of the patients were reactors to tuberculin. He is convinced that the toxins of tubercle bacilli have a special affinity for the terminations of nerves of the face; therefore he has treated a number of patients with injections of tuberculin or the antigen of Nègre, and good results are reported. Various nerves of the face are described in detail, and the author points out the importance of attempting to determine the underlying cause of facial neuralgia before any treatment more than that of an immediate palliative nature is undertaken.

Judaism and Science, with Other Addresses and Papers from the Writings of Solomon Solis-Cohen and with a Bibliography of the Writings and Addresses of Solomon Solis-Cohen. By Edward D. Coleman. Cloth. Pp. 274; 84. Philadelphia: Jewish Publication Society of America, 1940.

This book, which contains the writings of Solomon Solis-Cohen, was published by friends of the author in honor of his eighty second birthday. The volume is limited to his nonmedical writings. However, some of the papers bear some relation to medicine, such as "Washington's Death and the Doctors," "Can Our Procedures for the Judicial Determination of the Cause of Death be Bettered?" "The Proper Scope of Scientific (So-Called Expert) Testimony in Trials Involving Pharmacological Questions" and "Tuberculosis: A Social Question." In addition there are papers of general interest, such as "Henry George" and "Franklin, the Philadelphian." All the other papers deal with Jewish life, particularly with Jewish history. A bibliography of all of Solis-Cohen's writings, nonmedical as well as medical, is included in the volume. There is also a list of books that have been dedicated to him by various authors. The book shows the many and varied interests of Dr. Solis-Cohen, a sign of a truly great man.

A Code of Rules for the Prevention of Communicable Diseases in Schools. Issued by the Medical Officers of Schools Association. Tenth edition. Paper. Price, 3s. Pp. 71. London: J. & A. Churchill, Ltd., 1940.

In Great Britain the Medical Officers of Schools Association has made available, now in its tenth edition, a guide to school physicians in general supervision of hygienic conditions in order to give them information as to what to do specifically in relationship to the appearance of any of the infectious diseases. This booklet is similar to the one issued by the American Public Health Association on the "Control of Communicable Diseases," which has just been issued also as a separate circular by the United States Public Health Service and by the Army and Navy medical departments. The measures recommended are standard in most civilized countries. Especially valuable in this pamphlet is the material on the various types of ringworm, including the portion of the body concerned, the incubation period and the methods used in control.

The last edition of this book appeared in 1928. The present edition emphasizes the importance of the spread of disease by sprays of droplets from the nose and throat. Some of the incubation periods have been altered. That for whooping cough has been shortened because it is now possible to detect the disease sooner by the use of the so-called cough plates. For measles the incubation period has been extended to eighteen days because the use of the convalescent serum seems to make possible a longer incubation period. There is more relaxation of quarantine than used to be the rule in Great Britain.

You Can Be Happily Married. By Gilbert Appellhof Jr. Cloth. Price, \$2. Pp. 218. New York: Macmillan Company, 1941.

This is a comprehensive discussion of marriage by a priest of the Episcopal church. Though the American divorce rate is the highest in the civilized world, "Christian marriage has not been at fault in itself. But there has been neglect in the training of young people concerning their responsibilities as marriage partners," says the author. He discusses the problems of acquaintance, courtship and engagement; planning for the marriage, and the adjustments to be made in conjugal life, including financial and recreational problems. Particular emphasis is also laid on the maintenance of good health. The treatment throughout is wholesome and constructive, and it is supplemented by an extensive list of books for further reading.

While the book will be of greatest help to those who want a Christian approach to the subject, no one planning marriage could fail to derive assistance from it.

First Aid in Emergencies. By Eldridge L. Eliason, A.B., M.D., Sc.D., Professor of Surgery, University of Pennsylvania School of Medicine, Philadelphia. Tenth edition. Fabrikoid. Price, \$1.75. Pp. 250, with 135 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1941.

The popularity of this little book on first aid is attested by its being now in the tenth edition since its original publication in 1915. Dr. Eliason has packed in a tremendous amount of valuable information on first aid work. It is to be highly recommended to those for whom it was intended, namely firemen, police, life guards, sailors, Boy Scouts, Campfire Girls and factory workers. This otherwise fine book is marred by the recommendation of tincture of iodine in fresh wounds. The reviewer feels that first aid of this type will do more harm than good. For first aid of any wound, a clean dressing is the most important. If any treatment of the wound at all is necessary, soap and water is preferable without the use of any antiseptic.

Modern Cosmetology: The Principles of and Practice of Modern Cosmetics. By Ralph G. Harry, F.I.C., M.B.I.P.H., F.R.M.S. Cloth. Price, \$5. Pp. 288. New York: Chemical Publishing Co., Inc., 1940.

This book should be of assistance to both the dermatologist and the cosmetic chemist to understand more fully the close relationship existing between dermatology and cosmetics. The monographs on the histology of the skin and its appendages are well written, and the accompanying photomicrographs are excellent. Its formulas include new products which have recently been introduced into cosmetic manufacturing and it explains quite clearly the purposes of the various products. In this connection, however, more detailed information of the composition and properties of the various new synthetic emulsifying, shampoo and penetrating agents should have been included. Since the physiologic effects of many of these products have not as yet been definitely determined, caution should be exercised in their use. Except for several definite technical errors, the book is clear, concise and instructive.

Handbook of Anesthetics (Formerly Ross and Fairlie). Revised by R. J. Minnitt, M.D., D.A., Director of Anesthetics, David Lewis Northern Hospital, Liverpool. With chapters on Local and Spinal Anesthetics by W. Quarry Wood, M.D., Ch.M., F.R.C.S.E., Surgeon, Edinburgh Royal Infirmary, Edinburgh. Fifth edition. Cloth. Price, \$4. Pp. 364, with 103 illustrations. Baltimore: William Wood & Company, 1940.

The book deals briefly with local and intravenous anesthesia but is principally devoted to agents for general anesthesia that are given by inhalation and to equipment for their administration. The book is more valuable for English anesthetists than for those in the United States, but the material reflects an extensive experience on the part of the author with general inhalational anesthetic agents. The most valuable portion is the material concerning the use of chloroform—an agent which is no longer used enough in this country for many anesthetists to learn much about it.

Die Chirurgie des Mediastinum und des Ductus thoracicus. Von Prof. Dr. H. Killian. Paper. Price, 28 marks. Pp. 257, with 141 illustrations. Leipzig: Georg Thieme, 1940.

The surgery of the mediastinum and thoracic duct was at first intended as a chapter of the Kirschner and Nordmann Surgery but was published as a monograph instead because of its size. The book is well illustrated, and each chapter terminates with an exhaustive bibliography. The general construction of the page, the style and the way in which the material is handled is similar to the rest of Kirschner and Nordmann's *Die Chirurgie*. The trite phrase "the book is a veritable mine of information" is the best description the reviewer can use. It will be valuable addition to any collection of thoracic surgery.

Exercitatio anatomica de motu cordis et sanguinis in animalibus. [Anatomical Studies on the Motion of the Heart and Blood.] By William Harvey, M.D. An English Translation with Annotations by Chauncey D. Leake, Professor of Pharmacology, University of California, San Francisco. Third edition. Paper. Price, \$1.50. Pp. 150, with 9 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, Publisher, 1941.

This translation with annotations is now in its third edition. It is a well presented classic in the field of medicine which should be appreciated as a gift by any medical student or physician.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

UNUSUAL SERUM REACTION FROM TETANUS ANTITOXIN

To the Editor:—Is it possible to have a strong acetone odor to the breath in other conditions than diabetic acidosis, such as in a serum reaction? A truck loader aged 20 sustained a severe laceration of the left ear and numerous contusions of the body in an automobile accident. The laceration was thoroughly cleaned and sewed up. Because of a history of asthma only 0.25 cc. (375 units) of tetanus antitoxin was given subcutaneously. Sutures were removed four days later, and another 0.25 cc. of the antitoxin given. Two days later the patient complained of weakness, polydipsia, polyuria and profuse vomiting. The temperature was 101.6 F. and there was a fruity odor throughout the house and particularly in the patient's bedroom. The tongue was dry and coated and the lips were cherry red. The urine was negative for dextrose, albumin and acetone bodies by the ferric chloride test. The specific gravity was 1.005; a blood sugar determination was not done. Ten cc. of calcium gluconate was given intravenously. Next day the temperature was 100 F., vomiting diminished and the acetone odor was still present but not so strong. Five days later the acetone odor had entirely disappeared, the temperature was normal and the patient felt well. The symptoms were probably due to a serum reaction caused by the marked tender swelling at the site of the second injection. Could the first dose of serum have sensitized the patient to the second dose? Would it be justifiable to omit prophylaxis for tetanus with a history of allergy?

M.D., Illinois.

ANSWER.—A diagnosis of severe serum sickness appears to fit this case. The fact that the symptoms did not occur for two days after the second dose makes it unlikely that the first injection sensitized the patient; if that were the case the symptoms should have come on more rapidly after the second hypodermic.

The symptoms complained of are unusual for serum sickness; urticaria, angioneurotic edema, fever and multiple joint pains are much more characteristic. The profuse vomiting may have been responsible for the acidosis. The ferric chloride test is for diacetic acid, and this acid is not always present even when acetone is found in the urine.

"Is it justifiable to omit prophylaxis for tetanus with a history of allergy?" Some large institutions have of late discontinued the use of antitoxin as prophylaxis against tetanus. They know that the incidence of serum sickness is much greater than that of tetanus; they deliberately gamble that the employee will not develop tetanus. They forget, however, that tetanus is a disease with a high mortality.

It is generally recognized as good advice that all those liable to injuries which may lead to the development of tetanus should be actively immunized against tetanus by the administration of tetanus toxoid. This procedure has now been in vogue for many years; the French have immunized their soldiers and their horses; the Italian and British armies have followed suit. The midshipmen of the United States Naval Academy have been immunized for several years; other branches of the United States Navy are now being inoculated. Pediatricians are now giving combined tetanus and diphtheria toxoid. Not one immunized person or horse has developed tetanus. Over a million injections have been given without serious reaction.

The asthmatic are particularly prone to have serum reactions, especially if sensitive to horse dander. All allergic persons should receive tetanus toxoid so that they need not fear serum sickness. If, however, they have not been immunized with toxoid and are injured, tetanus antitoxin should be administered cautiously in small divided doses. If they happen to be sensitive to horses they should receive the new despeciated tetanus antiserum in which the horse serum has been so changed that reactions are minimal (Schaeffer, Martin, and Myers, G. B.: Tetanus in a Serum-Sensitive Patient Successfully Treated with a New Despeciated Antiserum, *J. Allergy* 12:188 [Jan.] 1941). When the patient is known to be allergic one must likewise think of the possibility of anaphylactic shock at the time of the second injection and be prepared to treat it expeditiously with epinephrine hydrochloride.

CHRONIC ULCERS OF LEGS WITH DIPHTHEROID BACILLI

To the Editor:—I have recently been called on to treat a patient with chronic ulceration of the lower part of the leg of two years' standing. The bacteriologic examination shows a preponderance of a diphtheroid organism with *Staphylococcus albus*. Use of sulfathiazole internally is unavailing. The only mention of such a cutaneous infection is in Sutton's last book, in which he suggested autogenous vaccine, which is now being tried. Andrews in his 1940 edition mentioned a disease of the skin due to the Klebs-Löffler bacillus called Barco rot but said nothing about diphtheroid ulcerations of a chronic nature. Can you advise any other type of treatment or refer me to any literature on this disease?

M.D., Iowa.

ANSWER.—Two questions arise at once with regard to this case: 1. Is the diphtheroid bacillus present a pathogen? 2. If it is, does it play an etiologic role? Most of the diphtheroids are saprophytes of no etiologic significance. A group of English dermatologists, however, has reported a series of cases in which a diphtheroid bacillus was an active factor in the causation of cutaneous ulcers. Barber, Giuseppe and Knott (*Ulceration of the Skin Caused by a Diphtheroid Bacillus*, *Brit. J. Dermat.* 32:71 [March] 1920) studied 3 cases. In 2 of these the bacillus was obtained from the base of the ulcer after careful removal of the superficial debris. In the third, a pure culture was obtained by puncture of the skin just beyond the edge of the ulcer. In all their cases the bacillus proved to be one of the higher diphtheroids, closely resembling the Klebs-Löffler group except for lower toxicity for the guinea pig and lack of response to diphtheria antitoxin.

Slight benefit was obtained from vaccines made from ordinary pus organisms, but prompt response was seen from autogenous vaccine made from the diphtheroid bacillus, given subcutaneously in small doses (beginning with $2\frac{1}{2}$ million and increasing to twice this amount on the fifth day). To the third patient of their series they gave the vaccine intravenously after using it subcutaneously for a time and gradually increased the dose to 150 million. Mild febrile reactions occurred during this course. On a number of occasions the disease flared up during treatment and new ulcers appeared. Trauma, even the puncture of the hypodermic needle, caused new ulcers to form. A cutaneous graft was used in 1 case. The grafts were retained, but ulcers formed at the sites from which the grafts had been taken.

Acridiflavine in weak emulsion (1:5,000) was beneficial, but when the strength was increased to 1:1,000 it proved irritating. In the third case, permyase jelly, containing the bodies of maggots, was decidedly beneficial.

Clinically the primary lesion was a necrotic pustule quickly breaking down to form a phagedenic ulcer and spreading rapidly along the surface and into the depth of the tissues, down to muscle at times. The blood vessels were resistant and could sometimes be seen at the base of the ulcer. The borders of the ulcers were ragged, red or bluish, and the base was covered by a thick yellow adherent slough. On removal of this, bright red granulations exuding seropus appeared. The ulcers often healed centrally as they spread peripherally. The scars were rough and sometimes keloid. In 1 case the primary lesions were blood vesicles.

Guinea pigs were inoculated with the pure cultures of the diphtheroid bacillus, and it proved to be weakly pathogenic, the toxicity increasing with the passage through several animals. The blood serum of these animals agglutinated the organism in dilutions of 1:200 to 1:400. The blood serum of 1 of their patients agglutinated in a 1:500 dilution.

If the case under discussion under equally rigid tests proves to be a genuine diphtheroid infection, it should be reported. If, however, the bacillus cannot be shown to be pathogenic and the patient does not improve with the vaccine made from the diphtheroid bacillus or shows only about the same improvement with this vaccine that is obtained from others, the problem of diagnosis has yet to be solved. The paper of Kilbourne (*Leg Ulcers of Unrecognized Etiology*, *THE JOURNAL*, June 4, 1932, p. 1955) gave a list of the causes of ulcers of the leg in a series of 150 cases and furnished interesting discussions on diagnosis and treatment. In a paper on the etiology and treatment of ordinary ulcers of the leg, Zimmerman and Faller (*Etiology and Treatment of Ulcers of Leg*, *Surg., Gynec. & Obst.* 70:792 [April] 1940) rejected the usual explanation of the pathogenesis of the so-called varicose ulcer and gave an account of their experience in treatment.

An editorial (*Delayed Wound Healing*, *THE JOURNAL*, June 17, 1933, p. 1936) discussed the factor of disturbed carbohydrate metabolism and referred to the work of Williams and Dick (*Decreased Dextrose Tolerance in Acute Infectious Disease*,

Arch. Int. Med. 50:801 [Dec.] 1932). Cohen's paper (Leg Ulcers Due to Thyroid Dysfunction, *THE JOURNAL*, Jan. 27, 1934, p. 283) may be of interest. These are only a few of many papers on this subject.

PSORIASIS AND VITAMIN B

To the Editor:—A patient has trigeminal neuralgia of four years' duration and also psoriasis of ten years' duration for which he has been treated in various hospitals. In the course of treatments for trigeminal neuralgia I have used liver, iron and thiamine hydrochloride daily with good results. During the treatment the psoriasis disappeared without any sort of local treatment. Six months later, in September 1940, the psoriasis reappeared. This time I used thiamine hydrochloride alone, and again the psoriasis disappeared. The first time the patient received thiamine hydrochloride was in March, before the summer, whereas the second time it was in the fall, before the winter season, so that I feel that the season of the year had nothing to do with the disappearance of the psoriasis. Has psoriasis been investigated from the point of view of being a vitamin B deficiency or in the nature of an abortive form of pellagra? I shall appreciate any literature or comment you could offer me.

Harry Joel Zisk, M.D., Brooklyn.

ANSWER.—Pulay (Le "psoriasis vulgaris" et son traitement, *Bull. de dermat. et de syph.* 43:1308, 1936) accepted Schamberg's theory of the parakeratotic diathesis and his demonstration that retention of nitrogen occurs in cases of psoriasis. He cited Kerckhof's discovery that an excess of lipoids can be demonstrated histologically in the psoriatic skin and claimed to have demonstrated as his contribution the constant occurrence of cholesteremia in persons with psoriasis. He said that the metabolism of fat is under the control of the pituitary gland, the cortex of the adrenal glands and vitamin B. In support of the latter statement he cited the occurrence of cholesteremia in beriberi and alimentary dystrophy and its correction by vitamin B.

His theory of the treatment of psoriasis is therefore a regimen limiting both albumins and fats of the diet and supplying vitamin B. This he supplemented with adrenal cortex extract, extract of the anterior lobe of the pituitary gland and extract of the pancreas in certain cases. Electrotherapy in some form not stated explicitly was also used. With this regimen he claims to have cured 75 per cent of his series of 850 patients.

Madden (Treatment of Psoriasis, *THE JOURNAL*, Aug. 24, 1940, p. 588) has reported his results with Pulay's treatment and variations of the combination he recommended. All patients were given the vitamin or vitamins by mouth for from four to ten weeks. Those on a diet low in fat were instructed to eliminate the foods containing much fat from their diet, but there was no effort to control the diet exactly.

Of 19 patients treated with a diet low in fat, with 750 international units of thiamine hydrochloride daily, extract of anterior pituitary and adrenal cortex extract, 1 was cleared, 6 were improved and 13 obtained no benefit.

With the same dose of the vitamin, the same diet and extract of anterior pituitary without the adrenal cortex extract, 19 patients were treated, with the result that 1 was nearly cleared, 2 were improved and 16 were unimproved.

With the diet low in fat and with thiamine hydrochloride equivalent to 1,000 international units daily, 13 patients were treated, 3 completely clearing, 4 nearly clearing, 3 improving and 3 being left without improvement. Of those who were cleared, 1 had a recurrence in six months and another in eight months, and the third was still free of psoriasis a year after cessation of treatment.

A fourth group was given thiamine hydrochloride alone, equivalent to from 750 to 1,250 international units daily. Of 27 patients, 4 lost all evidence of psoriasis, 5 were much improved and 18 failed to obtain any benefit. Those who were cleared remained so for from three months to two years and then had a recurrence. On repetition of the treatment, 2 were resistant and the other 2 yielded again to thiamine hydrochloride.

A group of 14 patients were given the vitamin B complex, containing 600 to 900 international units of vitamin B₁, 80 to 120 Sherman units of vitamin B₂ and an unstated amount of vitamins B₃, B₆ and B₁₂ and nicotinic acid. Thirteen showed no change, and 1 became worse.

A group of 20 patients with psoriasis was given brewers' yeast containing in the daily portion 85 international units of vitamin B₁ and 143 Sherman units of B₂. Two of these were improved decidedly, 14 were not improved and 4 grew worse.

Madden concluded that a diet low in fat, with 1,000 international units of vitamin B₁ daily is the best combination.

The fact that 2 patients with recurrences did not benefit by a repetition of the treatment which a few months previously had removed the cutaneous lesions must be added to the many evidences of the capriciousness of psoriasis. The fact that so many patients were not at all affected by the administration of thiamine

hydrochloride, with or without the diet low in fat, shows that it is not the answer to the prayer of the person with psoriasis. It promises, however, to be of great help to many.

An excellent reason for the use of this vitamin in connection with the diet low in fat is put forth in the statement (*Annual Review of Biochemistry* 9:384, 1940) that it has been demonstrated that dietary fat spares vitamin B₁. The less the fat in the diet, the greater need for this vitamin.

The simultaneous use of such an array of therapeutic measures makes it difficult to judge of the value of any one of them. Schamberg claimed excellent results from his diet low in protein, and there have been many reports of benefit from the more recently recommended diet low in fat. A combination of these with all the other measures leaves doubt as to just how much credit to accord the vitamin for any good results obtained. There are many methods of treatment for psoriasis, each of them effective in certain cases. Any combination of several of them should bring improvement in a large percentage of cases.

The case cited in the query seems to have been one in which there was a lack of vitamin B, and it is reasonable to assume that both the neuralgia and the psoriasis were dependent on this lack. Whether other patients with psoriasis are deficient in this vitamin is a pertinent question. Even though it proved to be the fact, it would not be proper to call psoriasis an abortive form of pellagra, for lack of nicotinic acid is the chief deficiency in pellagra, and psoriasis does not resemble it in any respect.

TOXICITY OF METHYL SALICYLATE

To the Editor:—Our staff has become involved in a discussion of the reasons for the greater toxicity of methyl salicylate over other salicylates and what part, if any, the methyl radical plays in the added toxicity. We have had several deaths from poisoning with methyl salicylate. Can you give us or tell us where to find the pharmacology of methyl salicylate and just what happens in its metabolism in the human body?

W. Eugene Powell, M.D., Rochester, N. Y.

ANSWER.—The "greater toxicity" of methyl salicylate as compared with other salicylates is perhaps more apparent than real. The fatal dose of methyl salicylate for animals is something like 50 to 80 per cent of that of sodium salicylate, according to data cited by Hanzlik. The difference is due partly to local irritation of the gastric intestinal canal, and the penetration into cells is probably more complete, because of the greater lipid solubility. The greater frequency of serious poisoning clinically is probably due to the swallowing of much larger doses of methyl salicylate than of sodium salicylate, with the production of violent gastroenteritis, generalized capillary paralysis, visceral congestions, pulmonary edema, narcosis and shock, in addition to the action proper of the salicyl. Salicylic acid is considered as phenol detoxified by the introduction of a water soluble acid group (carboxyl) resulting in a decreased lipid solubility, volatility and irritant properties. By converting the carboxyl into an ester of the methyl type the effect of this group is inhibited and the properties of lipid solubility, volatility and more intense irritant action reappear.

Approximately 50 per cent of the absorbed methyl ester is hydrolyzed to yield salicylic acid, which is excreted by the same mechanism as sodium salicylate; 0.1 per cent appears as unaltered methyl salicylate in the urine, and the remainder is unaccounted for by chemical methods and is presumably destroyed by the organism.

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- Ellinger, A., in Heffter, A.: Handbuch der experimentellen Pharmacologie, Berlin, Julius Springer, 1923, vol. 1.
- Hanzlik, P. J.: Actions and Use of the Salicylates and Cinchophen in Medicine, in Medical Monographs, Baltimore, Williams & Wilkins Company, 1927, vol. 9.

DERMATITIS FROM "DIC-A-DOO"

To the Editor:—A patient had a skin eruption of the hands and arms following the use of a paint cleaner marketed under the name of "Dic-A-doo." This product is manufactured by the Potent Cereal Company of Geneva, N. Y. Could you please inform me what chemicals in this product might be the causative factor in producing a dermatitis?

M.D., New Jersey.

ANSWER.—There are two forms of "Dic-A-doo" on the market. The powdered "Dic-A-doo" contains about 10 per cent of trisodium phosphate and about 8 per cent of sodium carbonate, both of which are strong alkalis, which may produce dermatitis.

The prepared "Dic-A-doo" also contains sodium carbonate and trisodium phosphate but in smaller proportions. These ingredients are believed to be the constituents most likely to produce dermatitis.

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INDUSTRIAL HEALTH MARCHES ON

CHAIRMAN'S ADDRESS

C. D. SELBY, M.D.

DETROIT

Your chairman was secretary of this section in 1920. This is mentioned only to serve as a landmark. In that year industrial medicine was merged with preventive medicine and public health in the Scientific Assembly of the American Medical Association.

Only now is the profession beginning to see that this relationship exists in practice as well as in the Scientific Assembly. I say "beginning," for the majority of physicians even yet think of industrial medicine as the care of compensation cases, and they believe that ordinary medical knowledge and experience are all sufficient for medical service in industry. Admitting the importance of medical knowledge in this and all other medical specialties, let us see how much of industrial medicine is actual practice of medicine and how much is prevention of disease.

Practice in industrial medicine is limited to the care of occupational injuries and diseases. All other functions are preventive in character and purpose. Some index of the relative values of the two, those functions which can be regarded as remedial and those regarded as preventive, appears in the relative proportions of time lost by industrial workers from industrial causes on the one hand and nonindustrial causes on the other.

The 1940 experience of the Owens-Illinois Company of Toledo illustrates this point and clearly indicates the magnitude of the opportunities for preventive medicine. Mr. W. G. Hazard,¹ of the personnel department of this company, reports that with an average of 14,580 employees on the payroll each month during 1940 there were 23,700 absences from work during the year, 60 per cent of which were for medical reasons. Of these absences only 1 per cent were from industrial causes, industrial injuries and occupational diseases; 59 per cent were from nonindustrial causes, the ordinary sicknesses not at all related to occupation, and injuries received outside the places of work; 31 per cent asked permission to be absent, and 9 per cent gave no reason for their absence.

Let us look at these figures in another way. Of all absences, 1 per cent were of such nature as to require treatment by industrial physicians or specialists, to whom they were referred for the care of industrial injuries or occupational diseases. Fifty-nine per cent were of such nature as to require treatment, but by

the general medical profession, not by industrial physicians, because they were not occupational in origin, being purely personal and arising from causes outside the work.

From these figures it is seen that only 1 per cent of all disablements call for the type of medical service in industry that many physicians consider to be industrial practice. When the American Medical Association merged industrial medicine with public health and preventive medicine in the Scientific Assembly, it foresaw the need of disease prevention in relation not only to this 1 per cent, but also to the other 59 per cent who are disabled from ordinary sicknesses and nonoccupational injuries.

Industrial medicine is attempting to reduce all disabilities from sickness. Therefore it needs the full cooperation of public health agencies and the general practicing profession. How much the general practitioners are involved is illustrated further by the experience of one automobile company in its widely scattered groups of employees aggregating, in 1940, a total of 187,773, male and female. There was a total of 21,173 who were disabled some time during that year for periods exceeding seven days from nonoccupational causes—slightly in excess of 11 per cent. The number of days lost was 828,988. The average loss per case was thirty-nine and two-tenths days and the average loss per employee was four and forty-two one hundredths days.

The greatest sources of lost time are given in the accompanying table.

The importance of the nonoccupational sicknesses, excluding nonoccupational injuries, become more apparent when directly compared with the occupational diseases. In this group of 187,773 workers, the latter caused 69 persons to lose time and they had 2,483 days of disability. The nonoccupational illnesses caused 18,944 persons to lose time, and they had 742,937 days of disability. The ratio of days lost from occupational and nonoccupational sicknesses was 1 to 300.

These data on ordinary sickness in the employed population should give our profession cause for thought. They suggest that our greatest opportunities for progress in disease prevention lie in the control of those conditions which are the greatest sources of lost time, namely appendicitis, the genitourinary diseases, the virus infections and diseases of the tonsils. These are in the general medical field, and they emphasize the responsible part that the general medical profession must play in the safety of the employed population.

INDUSTRIAL HYGIENE ACTIVITIES OF NATIONAL DEFENSE

With this background let us see what is happening in the industrial hygiene activities of national defense. The Administrator of the Federal Security Agency,

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

1. Hazard, W. G.: Trained Nurse and Hospital Review, May 1941.

Mr. Paul V. McNutt, has been made coordinator of all health, medical, welfare and related activities of national defense.

He has said "From the vantage point which I occupy I have tried to emphasize the spots in the public health scene which I think most need emphasis. The problems of industrial hygiene, of medical and hospital care and of nutrition seem to me the most immediate."

Mr. McNutt is authorized, with the approval of the President, to appoint such advisory committees and subcommittees as he may find necessary or desirable to assist him in his coordinating duties. One is known as the Subcommittee on Industrial Health and Medicine and it functions through the Health and Medical Committee, of which Dr. Irvin Abell is chairman. In this manner it acts as an adviser to the coordinator on industrial health and medical activities related to national defense.

The Division of Industrial Hygiene of the National Institute of Health, U. S. Public Health Service, because of its experience, facilities and relationship with other agencies, both governmental and nongovernmental, was recommended by the subcommittee to

Sources of Lost Time

	Number	Days Lost
Appendicitis	2,199	101,611
Nonoccupational injuries	2,229	86,051
Genitourinary diseases	1,143	84,061
Influenza	1,772	43,069
Tonsillar infections	1,871	38,034

assume the leadership in a program for the protection of the health of workers in defense industries.

Such a program was adopted at a conference in February 1941, which was sponsored by the Division of Industrial Hygiene of the National Institute of Health and attended by representatives from the various state industrial hygiene units and by the Subcommittee on Industrial Health and Medicine. The objectives are:

1. The evaluation and control of the various health hazards resulting from exposure to dusts, fumes, gases, vapors and other materials.
2. The provision of advisory services to industry in connection with the construction of new plants and the renovation of old plants, so that adequate facilities for health and safety may be included in the plans.
3. The promotion of physical examinations and medical services for workers, in order that the benefits of preventive and curative medicine may be applied promptly to their individual health problems.
4. The control of communicable diseases among workers through a control program developed in connection with the general public health services of the community.

This program is now being applied in each important industrial area. Additional funds, made available by Congress, have enabled the Division of Industrial Hygiene to assign mobile units, each unit consisting of a physician and an engineer, to work in key defense industries in cooperation with various state departments of health. The Division of Industrial Hygiene is also cooperating with the War Department in its program to protect the health of civilians employed in industrial production under its direct supervision and in its jurisdiction over contract production.

2. McNutt, Paul V.: *Special Problems in Our Health*, Annual Conference of State and Territorial Health Officers with U. S. Public Health Service, Washington, D. C., April 29, 1941, *Defenses*, Pub. Health Rep. 56: 988 (May 9) 1941.

In the program for the protection of the health of workers in defense industries, the physician also bears certain responsibilities. These are (1) to inform himself concerning occupational diseases so that he will recognize such diseases readily in the course of his practice, (2) to report to the proper authorities the occurrence of occupational diseases among workers coming to his attention, (3) to stimulate preemployment and periodic physical examination of workers in industry and (4) to cooperate with the local health agency which is responsible for protecting the health of the workers.

It is emphasized that the industrial hygiene program which has been outlined has been created, not as an emergency improvisation, but as an integral part of our national life in the future, and that the cooperation of all concerned with industrial health is required if industrial workers are to attain a high level of efficiency and health.

The American Medical Association must have realized this when it created the Council on Industrial Health, the principal object of which has been a better orientation of the medical profession in its relations to industrial health. This has occupied a significant place in the development and early activities and scope of the Council.

"In this particular direction," said Dr. Carl M. Peterson, Secretary of the Council, "I am convinced that the majority of the medical profession has come to know that there is more to industrial health than merely remedial activities, that as soon as the physicians acknowledge the phase of preventive medicine in industrial work they will begin to make their real contributions."

RESPONSIBILITY OF THE MEDICAL PROFESSION

Through its annual conference and the activities of the committees on industrial health in the state and county medical societies, the Council is fostering a sense of responsibility for the health of the workers on the part of all elements of the medical profession. And no doubt its major contribution will be to demonstrate that industrial health work must go through three principal channels: the industrial hygienists, the physicians in industry and the private practitioners, both in the clinical specialties and in general practice.

The Council has stimulated educational activity at all levels, undergraduate, postgraduate and graduate. Truly significant of progress in this direction is the postgraduate work of the various county and state medical societies, because the immediate needs in industrial health must be met by the general practitioners of medicine.

Another significant development of the Council is its move to register men limiting their practice to industrial health or giving special attention to it. More recently there has been an attempt to register those who wish to serve in industry, whether qualified or not. The registration of these, however, has introduced a new problem; namely, placement in industry.

How can these doctors, who wish to serve in industry, find the opportunity to do so? Doctors do not offer their services; they must wait until invited.

To a degree, the profession is preparing itself, in this fashion, faster than industry. That brings up the question of whether physicians, by educating themselves in industrial medicine, can increase the demand for their services or should this preparation follow as a conse-

quence of an increased interest on the part of industry and, if so, how can the profession stimulate increase of interest?

There are several moves on the part of industry toward this end, and in time they will have their results. But in the meantime there seems to be no real reason why the medical profession should remain passive. The Michigan Committee on Industrial Health has decided to join with the Manufacturers Association in the promotion of interest in industrial health, with emphasis on physical examinations. The manufacturers are to promote the interest and the committee to carry on the educational campaign with the doctors. Such a joint effort is being considered in two important manufacturing centers, and preliminary arrangements are now being effected.

The Connecticut State Medical Society is making a notable contribution through a joint committee on industrial health of the state society and the Manufacturers Association of Connecticut, Inc. This committee has published and distributed among employers a well prepared booklet entitled "Conservation of Man Power Through Extension and Improvement of Industrial Medical Service." It is accompanied by a questionnaire the return of which will develop valuable information about industrial medical service as it now actually exists in Connecticut. No doubt there are similar activities in other states. With such activity in the medical profession the general practitioners will become increasingly interested and consequently more effective in meeting their responsibilities with regard to industrial health.

Even so, there will always be a place in the scheme of industrial medicine for the full time industrial physicians who are coming more and more to be regarded as specialists. The large industries will always have need for such, while the smaller plants will continue to look to the general practitioners for their services. The full time men will, for the most part, be more active in the American Association of Industrial Physicians and Surgeons than they are in this section. That is an organization which is making notable contributions to progress in this field. A recent meeting in Pittsburgh had all the attributes of a postgraduate course, and this will be regarded as having been such.

At the request of Surgeon General Parran, the American Association of Industrial Physicians and Surgeons created an advisory committee that conceived the principles on which the present national defense activities in industrial hygiene are founded. Among its chief recommendations was one for such coordination as is now being effected by the Subcommittee on Industrial Health and Medicine.

The emphasis thus far has been placed on relationships of physicians to the industrial health movement and particularly the service they are rendering directly in industry. We must not overlook the preventive medicine and public health aspects. Preventive medicine has made notable contributions and is continuing to do so, largely through studies in industrial toxicology and of the exposures arising out of the use of toxic materials in industry.

In the control of industrial conditions that cause occupational diseases and impair health, the industrial hygiene engineers have been most active. They have made great progress in this direction and, frankly, to them must go most of the credit for the splendid occupational disease record of industry. The industrial hygiene engineering field is represented in a national way by two important organizations—the American

Association of Industrial Hygienists, which meets annually with the American Association of Industrial Physicians and Surgeons and the Industrial Hygiene Section of the American Public Health Association, which has been active for about twenty-five years.

It is not possible to comment on all of the organizations now active in promoting industrial health. Suffice it to say that there is much activity, and it is not limited to medical organizations. In this is a direct challenge to this section. Here we have a mergence of the three medical fields that are most concerned with a large segment of population—employed adults. And as a nation concerned with defense we are looking to that segment for materials which are essential to our defense. Admitting the importance of public health and preventive medicine in the lives of all age groups, whether employed or not, may I suggest that the Section on Preventive and Industrial Medicine and Public Health can, with ample justification, regard the health of the industrial population as its national responsibility for the period of national defense.

3044 West Grand Boulevard.

ENCEPHALITIS IN THE YAKIMA VALLEY

MIXED ST. LOUIS AND WESTERN EQUINE TYPES

WILLIAM McDOWELL HAMMON, M.D., DR.P.H.

SAN FRANCISCO

For a number of years, in the summer months occasional cases of encephalitis of unknown cause have occurred in human beings in the Yakima valley, Washington. In 1939 the number of these cases first reached epidemic proportions. During the same period deaths occurred sporadically and in small outbreaks among horses, attributed generally to forage poisoning or botulism or occasionally simply diagnosed as blind staggers. In 1939 more than 600 cases of encephalomyelitis in horses were reported for the same region in addition to 31 cases of encephalitis in man. It was presumed at this time that both human beings and horses had been infected with the virus of Western equine encephalomyelitis, and a few samples of blood serum from each group, when tested by Miss Beatrice Howitt, of the Hooper foundation, were found to contain antibody for this virus.

In 1940 encephalitis again appeared in epidemic proportions, and on August 24, by request of the Washington State Health Department to the Hooper Foundation, an investigation of the epidemic was begun. At this time about 35 cases of encephalitis in man had been reported, and at the end of the epidemic this number had reached 86. During the same period about 20 cases of encephalomyelitis in horses were known to have occurred. Prior to this date, members of the state health department and of the Yakima city and county health department had made a preliminary investigation of numerous cases, and throughout the course of the outbreak and during the follow-up period they assisted and cooperated.

The survey had as its purposes to determine if possible the cause and the mode of transmission of the prevalent disease, in order that control measures might be instituted; to make an analysis of the clinical and

Aided by a grant from the National Foundation for Infantile Paralysis, Inc.
From the George Williams Hooper Foundation, University of California.

laboratory findings as a means to improved differential diagnosis in this group of virus infections of the central nervous system, and to analyze and weigh the effectiveness of the therapeutic measures employed. The results of the epidemiologic part of the survey are presented in detail in a separate publication.¹ Only a brief review

TABLE 1.—Results of Neutralization Tests on Patients and Controls

Neutralization Test	Controls		Patients	
	Num-ber	Per-centage	Num-ber	Per-centage
Positive for Western equine virus only....	3	4.0	14	28
Positive for St. Louis virus only.....	19	25.4	8	16
Positive for both.....	2	2.7	28	56
Negative for both.....	51	67.9	0	0
Total tested.....	75	100.0	50	100
Total positive for Western equine virus...	5	6.7	42	84
Total positive for St. Louis virus.....	21	28.0	36	72

will be given here of some of the conclusions of this phase of the study, and no attempt will be made to present much of the evidence on which these are based.

EPIDEMIOLOGIC ASPECTS

Early in the investigation, it became obvious that from both the clinical and the epidemiologic standpoint the outbreak presented certain characteristics generally attributed to one or the other of two epidemic virus encephalitides, that due to the St. Louis virus and that due to the virus of equine encephalomyelitis, Western type, and on the basis of available information neither of these alone would account for the features of this particular outbreak. Since in earlier studies Howitt² had found neutralizing antibodies for the St. Louis virus as well as for the Western equine virus in some of the serums from patients in the San Joaquin valley of California, the possibility of the two viruses being associated seemed likely.

Blood was taken for neutralization tests against both viruses from most of the 86 reported patients as well as from a comparable control group of 75 persons not suffering from encephalitis. Miss Beatrice Howitt performed these neutralization tests.

After a careful analysis of clinical data, autopsy material and the results of the neutralization tests, 58 cases of encephalitis in human beings were definitely classified as cases of encephalitis type B (St. Louis or equine or both). Except for 2 fatal cases, the diagnoses in all this group were confirmed by autopsy, by examination of the spinal fluid or by neutralization tests. Neutralization tests were performed on the serum in 50 of the 58 accepted cases, and all the serums neutralized at least one of the two viruses. No blood was obtained from 7 patients who died and from 1 child aged 2 years.

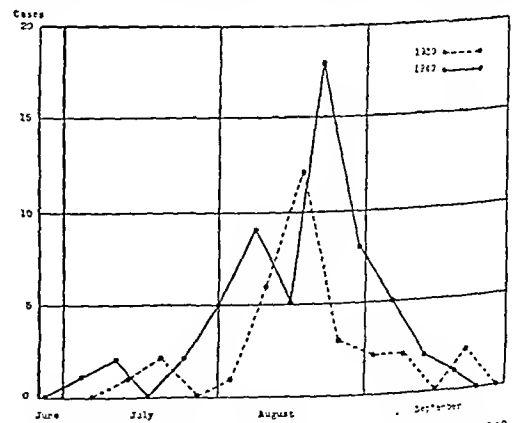
A number of other patients probably suffered from the same disease, and the clinical course of some was indistinguishable from that of encephalitis, but when certain data were not obtained and the diagnosis could not be so positively determined, these patients were excluded from the series. Seventeen cases of poliomyelitis were reported from Yakima County during the same season, a part of a large epidemic centering in

Tacoma and Seattle, and it is possible that in several of the children reported as having encephalitis, whose serum failed repeatedly to neutralize either of the encephalitis viruses, the condition was due to poliomyelitis virus. Five girls 8 to 12 years of age were in this group. Several children whose illness was diagnosed first as encephalitis were later found to have poliomyelitis.

In table 1 are shown the results of the neutralization tests on the patients and on a control group. It will be noted that 28 per cent of the control group had antibodies to the St. Louis virus, a finding similar to that of Muckenfuss, Smadel and Moore³ in their study of a postepidemic sample of the St. Louis population. Thus it would appear probable that the St. Louis virus had been present in the Yakima valley for some time. Further support was given this supposition by finding that the mean length of residence in the Yakima valley was significantly longer among those whose serum neutralized the St. Louis virus, in both patient and control group, than among those who failed to neutralize that virus. No significant age difference, however, was demonstrable among the patients such as that found by Howitt² in the San Joaquin valley, which led her to believe that many of those with antibody to the St. Louis virus had acquired it in the Southwest prior to their migration to California.

The significance of the results of the neutralization test for the St. Louis virus became more apparent when they were compared with the results obtained by the same laboratory⁴ on samples of serum from patients and controls in other Western areas and were found to differ in a significant manner.

Most of the samples of blood were taken early in the course of the disease, but of 2 patients whose blood serum was tested early and late, 1 showed an increase in antibody titer for the St. Louis virus (change from negative to strongly positive) and the other a similar change in respect to the Western equine virus. This is generally accepted to be nearly as specific a diagnostic finding as actual isolation of the virus. Suitable autopsy



Incidence of encephalitis in Yakima County, 1939 and 1940.

material for study of the virus was obtained from only 1 patient, but unfortunately no virus was isolated. Any conclusion relative to the cause must therefore be based on clinical, epidemiologic and indirect labora-

1. Hammon, W. M., and Howitt, B. F.: Epidemiological Aspects of Encephalitis in the Yakima Valley: Mixed St. Louis and Western Equine Types, to be published.

2. Howitt, B. F.: Antiviral Substances to the Virus of Encephalitis (St. Louis Type) in Serums Collected in California, *Proc. Soc. Exper. Biol. & Med.* 38: 334 (April) 1938. Viruses of Equine and of St. Louis Encephalitis in Relationship to Human Infections in California, *Am. J. Pub. Health* 29: 1083 (Oct.) 1939.

3. Muckenfuss, R. S.; Smadel, J. E., and Moore, E.: The Neutralization of Encephalitis Virus (St. Louis, 1933) by Serum, *J. Clin. Investigation* 17: 53 (Jan.) 1938.

4. Buss, W. C., and Howitt, B. F.: Human Equine Encephalomyelitis in Kern County, California, 1938, 1939 and 1940, *Am. J. Pub. Health*, to be published. Howitt.²

5. Footnote deleted on proof.

tory evidence, but this all appears to support the same conclusion, that the outbreak was caused by the two viruses acting either singly or together. Evidence has been presented elsewhere by Hammon and Howitt¹ in support of the hypothesis that a number of mixed infections occurred, and laboratory evidence of the pos-

TABLE 2.—Incidence of Encephalitis by Age Groups and by Sex

Age Groups	Number of Patients		
	Males	Females	Total
0-4.....	3	1	4
5-9.....	2	0	2
10-14.....	0	0	0
15-19.....	3	0	3
20-29.....	6	0	6
30-39.....	7	0	7
40-49.....	5	0	5
50-59.....	7	4	11
60-69.....	7	4	11
70.....	7	2	9
Total.....	47	11	58

sibility of such mixed infection has since been demonstrated by Hammon.⁶

The first case occurred early in July, but the peak of the epidemic was sharp, with 18 patients having the onset of disease during the third week of August. The number then fell off rapidly, with the last proved attack occurring during the third week of September. The 1939 epidemic had a similar seasonal pattern. The accompanying chart shows the incidence of cases for both years.

The outbreak was restricted to the Yakima valley, a fertile agricultural area depending entirely on irrigation for all crops. The distribution of the cases fitted approximately the distribution of orchard lands rather than of land supporting other types of crops. The infection was encountered both in rural and in urban areas, but the rates were higher in rural and suburban districts. The morbidity rate for Yakima County excluding the city of Yakima was 62.7 per 100,000, and for Yakima it was 44.1, although the city was near the center of the epidemic region. Rates where the population was known were highest in small suburban towns near Yakima. A similar distribution was noted in the St. Louis outbreak of 1933.

Thirteen deaths occurred, resulting in a case fatality rate of 22.4 per cent, comparable to that of 20 per cent found in the St. Louis outbreak,⁷ much lower than that of 66 per cent encountered in the epidemic due to the Eastern equine virus in Massachusetts⁸ and much higher than the 6.9 per cent for the epidemic caused principally by the Western equine virus in the San Joaquin valley.⁴

Cases were encountered in all age groups ranging from 2 to 80 years, but the rates obviously increased progressively with age (table 2). The average age was 45.7 and the median 51. This is comparable to the findings in the St. Louis outbreak⁷ but not to those reported by Feemster⁹ in the Massachusetts outbreak due to the Eastern equine virus (affecting chiefly infants and children) or to those reported by Buss and Howitt⁴ for the San Joaquin valley (predominantly affecting infants and children).

The sex distribution was not comparable to that in any previously reported outbreak proved to be due to either of these viruses; 81 per cent of the patients were males, and except for a 2 year old girl no female under 52 was affected. Occupational and environmental factors appeared to be responsible at least in part for this peculiar age and sex distribution.

Most patients lived near areas of potential mosquito breeding (irrigation ditches and irrigated land, serving as excellent breeding places for *Aedes* mosquitoes), but such areas were a common feature of all rural and semi-rural areas in the valley. No survey was made of the prevalence of mosquitoes. Although most persons in the community who were asked believed 1940 to have been an average or subaverage year for mosquitoes, little weight can be placed on such opinion. For persons whose blood neutralized only the St. Louis virus, there was a correlation (the numbers were, however, small) with proximity to standing polluted water, and this factor did not correlate for the group whose serums neutralized only the equine virus. This finding is similar to that pointed out by Leake, Musson and Chope⁹ and by Jones and Bozalis¹⁰ relative to the St. Louis outbreak, and interpreted by them as incriminating certain *Culex* mosquitoes. Several species of *Aedes*, *Culex* and *Theobaldia* were found in the region, as was also *Anopheles maculipennis*.

Only traces of rainfall occur during any summer, and the summers of 1939 and 1940 were not exceptions; no fluctuation in the amount of water for irrigation used in any district (hydrographs were available for study) occurred from early spring till after the decline in the epidemic. Neither is it customary in the district most heavily involved (orchards) for the water to be shifted from one crop to another during this period. No unusual flooding or stagnation can be accounted for.

The blood serum of several wild and domestic birds and mammals was tested for the presence of antibodies to one or both of the viruses and some tests were positive. The details and implications of these findings on the epidemiology of the disease have been discussed in the paper, previously referred to,¹ covering epidemiologic aspects.

It was arranged that the physicians of the county should report each case of suspected encephalitis to the health department by telephone, and cooperation was

TABLE 3.—Duration of Hospitalization in Weeks

Time, Weeks	Number of Patients
<1.....	20
1-2.....	6
2-3.....	6
3-4.....	2
4-5.....	1
>5.....	1
Unknown.....	3
Total.....	39

readily obtained. Also, permission was granted that I should examine each patient and take a detailed history. As far as possible, therefore, each person was visited while ill and given a careful physical examination, usually on the day of reporting. Subsequent visits were made for follow-up notes at frequent intervals, where possible. An epidemiologic and clinical form including one hundred and sixty different items was filled out

6. Hammon, W. M.: Unpublished data.

7. Report on the St. Louis Outbreak of Encephalitis, Prepared by Direction of the Surgeon-General, Public Health Bulletin 214, United States Treasury Department, Public Health Service, 1935.

8. Feemster, R. F.: Outbreak of Encephalitis in Man Due to the Eastern Virus of Equine Encephalomyelitis, *Am. J. Pub. Health* 28: 1403 (Dec.) 1938.

9. Leake, J. P.; Musson, E. K., and Chope, H. D.: Epidemiology of Epidemic Encephalitis, St. Louis Type, *J. A. M. A.* 103: 728 (Sept. 8) 1934.

10. Jones, A. B., and Bozalis, G. S.: 1937 St. Louis Epidemic of Encephalitis: Follow-Up Studies, *J. Missouri M. A.* 27: 5 (Jan.) 1940.

following day the maximum temperature was 99.4 F. Physical examination revealed no evidence of infection of the upper part of the respiratory tract. The patient was alert and cooperative and, except for nausea (probably due to sulfapyridine), had no complaints. Slight conjunctivitis was noted, also tenderness of the abdominal muscles. There was slight stiffness of the neck and none of the back. Abdominal reflexes were absent, but no other abnormal neurologic conditions were noted. Lumbar puncture was performed and a normal pressure found, with clear fluid containing 77 cells per cubic millimeter, 51 per cent lymphocytes and 49 per cent polymorphonuclear cells. A trace of globulin was noted. Blood taken at that time neutralized the Western equine virus but not the St. Louis virus. Recovery was rapid, and within a few days the patient was discharged. At no time had she been irritable, drowsy or comatose.

Undoubtedly more cases of mild involvement occurred, but the diagnosis of encephalitis was not seriously entertained by patient or physician because of the atypical course of the illness. Fothergill¹¹ found no evidence of atypical or missed attacks in his serum neutralization survey of contacts in the Massachusetts outbreak due to the Eastern equine virus, but Buss and Howitt⁴ in Kern County, Calif., found a number of contacts, whose illness was not diagnosed as encephalitis, to have antibodies for the Western virus.

Incubation Period.—Some evidence was available regarding the incubation period of the disease in the history of persons who entered the valley shortly before the onset of their symptoms. Two patients had symptoms just seven days and another eight days after entering the valley from regions where encephalitis was not known to occur. Another entered the valley eleven days before the onset of symptoms but did not enter the section where the disease was most prevalent until the eighth day before onset. Another entered twenty-eight days before the onset of the disease. Only 1 person was known to have left the valley and contracted the disease elsewhere, but since an interval of only two days had elapsed it is probable that the infection had been acquired several days before the patient left. The group of 4 patients who showed symptoms within seven to eleven days after entering the region included 2 persons whose serum neutralized both viruses and 1 each whose serum neutralized only the equine or the St. Louis type. This would indicate that the incubation period for both diseases might be as short as or shorter than seven days. This is less than the usually accepted average incubation period for the St. Louis disease but represents almost the only evidence available for the length of the incubation period in the naturally acquired Western equine disease in man.

TREATMENT

In all cases treatment was largely symptomatic. Lumbar puncture frequently gave marked relief of the headache. One patient, aged 57, who had a prolonged illness of unusual severity was given two transfusions of blood from a person who had recovered from encephalitis earlier in the epidemic. She also was treated with sulfapyridine and eventually recovered completely. An early and a late examination of the blood of this patient showed that an increase of titer for the Western equine virus had developed between the eighth day and the fourth month.

Except for the earliest cases, either sulfanilamide or one of its related compounds was used in treatment

in nearly all. An analysis of all fatal cases showed that in only 1 was the patient treated early or with adequate doses with one of these drugs. This patient possibly died as a result of the treatment, for after apparent recovery, under continued therapy with sulfanilamide in doses of 40 grains (2.5 Gm.) a day, an elevation of temperature occurred on the twelfth day accompanied by a rash, and two days later death occurred. No blood counts were made. A similar analysis of drug therapy for the persons recovering revealed that few of these had received amounts of the drug within the minimum of the generally accepted therapeutic range. Therefore, although the physicians all felt that the drug was a useful therapeutic agent, no good evidence for such a conclusion is available. I feel that further trial of these drugs under controlled conditions and with a proper regard for their side reactions is warranted.

I would not recommend the use in any outbreak of Western equine encephalitis of the treatment recommended recently by Zichis and Shaughnessy¹² and based on their experiments with specific hyperimmune rabbit serum in guinea pigs. Howitt,¹³ as early as 1932, similarly showed the effectiveness of immune serum in the Western equine disease in guinea pigs if given early enough, but when given later it was ineffective. Doses calculated by weight in man comparable to those used by Zichis and Shaughnessy¹² in guinea pigs would require that several liters of hyperimmune rabbit serum be given an average man before a definite diagnosis of encephalitis of any kind could be made (at the first elevation of temperature or sign of disease). It was shown previously that at a time when a clinical diagnosis can be made, antibodies in large amount are already present in the blood of many patients (blood was drawn from many of the patients as soon as the physician in charge felt reasonably certain of the diagnosis, and in all cases but 1 in which the blood eventually neutralized the equine virus it did so to the maximum titer employed in the test on the first sample drawn), so the administration of additional serum could be expected to be of little or no value. Many disadvantages can be conceived in the early use of large amounts of any heterologous serum in the treatment of a disease presenting so many difficulties in differential diagnosis. Such difficulties were encountered by physicians and epidemiologists in Tacoma during the summer of 1940 when attempts were made to treat poliomyelitis with antistreptococcus horse serum. Serum reactions, frequently severe, not only were alarming to patient, family and physician but simulated many clinical features of the disease. Furthermore, in mixed epidemics such as that in Yakima, which I feel probably have occurred and will occur elsewhere, or in sporadic cases of encephalitis, it is impossible to make a specific etiologic diagnosis by any means now available in time to be justified in administering specific serum as Zichis and Shaughnessy would have physicians do.

Since no therapeutic control measures are available at present and the age distribution, geographic distribution and epidemiologic features of these two encephalides make them of special concern at present to military camps, it is even more important to consider what prophylactic measures are available. Formaldehyde-

11. Fothergill, L. D.: Equine Encephalomyelitis with Especial Significance: A Symposium, Can. J. Zoon. Dis., 1940.

Virus and Rickettsial Diseases with Special Reference to Public Health Significance, University Press,

12. Zichis, J., and Shaughnessy, H. J.: Experimental Western Equine Encephalomyelitis, J. A. M. A. 115: 1071 (Sept. 28) 1940.

13. Howitt, B. F.: Equine Encephalomyelitis, J. Infect. Dis. 51: 423 (Dec.) 1932.

treated vaccines for the equine viruses have been found effective in horses and laboratory animals and have been tried on human beings, but although mice may be protected against the St. Louis virus with similarly prepared formaldehyde-treated virus suspensions, to my knowledge these have not been tested in man. However, once an epidemic begins and the etiologic agent is definitely identified in a laboratory equipped for work with viruses, the time for effective use of a vaccine probably will have passed. It is of utmost importance, therefore, to determine for both viruses the exact means of transmission and the reservoir hosts in nature, in order that environmental control measures may be established.

CONCLUSIONS

1. An outbreak of encephalitis which occurred in the Yakima valley in 1940 involved both horses and man.

2. A diagnosis of encephalitis type B was definitely established in 58 of 86 reported cases, making a morbidity rate of 62.7 per 100,000 for the county of Yakima excluding the city of Yakima, and of 44.1 for that city.

3. The mean age of patients was 45.7, the median 51 and the range 2 to 80. The rate increased progressively with age. Eighty-one per cent of the patients were males.

4. The case fatality rate was 22.4 per cent (13 deaths).

5. Neutralization tests performed on the blood serum of 50 patients with a definitely established diagnosis showed a total of 86 per cent neutralizing the Western equine virus, 72 per cent the St. Louis virus and 56 per cent both. Seventy-five comparable control samples of serum showed neutralizing antibodies for the equine virus in 6.7 per cent, for the St. Louis virus in 28 per cent and for both in 2.7 per cent.

6. An increase in titer between an early and a late blood sample was noted once for each virus.

7. Clinical, epidemiologic and laboratory evidence all indicated the presence of both viruses, and it appears probable that some patients had mixed infections.

8. The blood serum of certain mammals and birds from the region showed neutralizing antibodies to one or both of these viruses.

9. The course of the illness in adults was similar to that described for the St. Louis disease. The frequency of occurrence of thirty-six symptoms and physical signs is shown in table 4.

10. Analysis of the data on 42 samples of spinal fluid shows that during the second and third day of illness a predominance of polymorphonuclear cells is usually encountered; after the third day the mononuclear cells predominate. More than 50 per cent of the total cell counts were between 50 and 300 cells per cubic millimeter.

11. Some mild attacks occurred which, without lumbar puncture or the neutralization test, would have been diagnosed as grip or infection of the upper part of the respiratory tract.

12. The incubation time in man for either virus may be as short as seven days.

13. Although many patients were treated with drugs of the sulfonamide group, no definite evidence of the effectiveness of these drugs was obtained.

14. Serum therapy with hyperimmune rabbit serum should not be attempted for the Western equine disease.

The Medical Center.

EXTRARECTAL MASSES CAUSED BY TUMORS OF THE RECTO-UTERINE OR RECTOVESICAL SPACE

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An extrarectal mass in the recto-uterine or rectovesical space is encountered frequently in the course of routine digital examination of the rectum. The significance of the mass seldom is recognized, and it is sometimes confused with primary carcinoma of the rectum. Because of the prognostic and diagnostic importance of extrarectal tumors, digital and proctoscopic examination should not be omitted in cases of obscure abdominal disease.

In 1895, Strauss,¹ discussing some cases of operative carcinoma of the stomach, stated: "Carcinomatous metastases in the liver were found at operation in this case, also in the retroperitoneal tissue, and in Douglas'

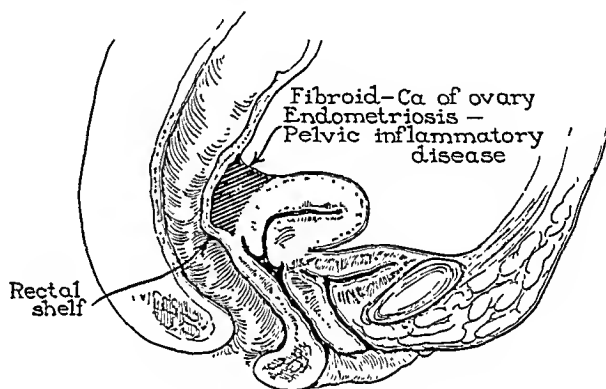


Fig. 1.—Sagittal section of female pelvis, with an implanted lesion in the recto-uterine space productive of a rectal shelf.

pouch. The latter situation we have found repeatedly as a site of metastases in carcinoma of the stomach and which on account of its accessibility to digital exploration merits more frequent attention during examination." This is the first mention that we have found in the literature of malignant growths in the pelvis secondary to primary gastric carcinoma; the importance of these growths was overlooked for fourteen years, until Blumer's² description in 1909. Since then "Blumer's shelf" has been mentioned frequently (figs. 1, 2 and 3). According to Blumer's original article, the finding of a shelf does not necessarily imply the presence of a metastatic or implanted malignant growth, but it can be and frequently is the result of an inflammatory process. Blumer stated that in his experience a shelf caused by an inflammatory process usually was incomplete or one sided. In 1835, Sym³ reported finding a tumor which projected into the rectum anteriorly, preventing irrigations. At necropsy the tumor was found to be the result of tuberculous peritonitis.

From the Section on Proctology of the Mayo Clinic.

1. Strauss, Hermann: Zur genaueren Kenntniss und Würdigung einer im milchsäurehaltigen Magensaft Massenhaft vorkommenden Bakterienart, *Ztschr. f. klin. Med.* 28: 578-585, 1895.

2. Blumer, George: The Rectal Shelf: A Neglected Rectal Sign of Value in the Diagnosis and Prognosis of Obscure Malignant and Inflammatory Disease Within the Abdomen, *Albany M. Ann.* 30: 361-366 (May) 1909.

3. Sym, cited by Blumer.²

Many of the patients in our series came to the Mayo Clinic primarily because of rectal trouble, and the finding of an extrarectal mass on routine digital or proctoscopic examination was the first sign to direct attention to the primary source of the trouble.

Our study comprised a detailed investigation of 254 consecutive cases of malignant tumor of the recto-uterine or rectovesical space, in which the masses were found on examination. The patients were studied in order to determine what produced the mass, as decided by clinical, roentgenologic, surgical or postmortem examination. Of the patients 138 (54.3 per cent) were women and 116 (45.7 per cent) were men. The predominance of women is explained readily by the fact that women are more likely to have pelvic tumors than are men.

We have grouped the extrarectal masses under seven classifications, and the results of our study will be reported in accordance with this classification.

RESULTS

Pelvic Implants from Growths in the Upper Part of the Abdomen and Pelvic Metastatic Growths.—These conditions were represented by 42 patients, or 16.6 per cent of the series of 254. Thirty were men and 12 were women. This distribution by sex is in keeping with the data of other authors. The relative rarity with which these conditions are found among women is explained by the mode of invasion of the recto-uterine and rectovesical spaces; that is, fragments of malignant tissue gravitate to the most dependent part of the abdomen and become implanted there. In women, the gravitating cells are stopped by and engrafted on the ovaries. A second reason for the disproportion according to sex is that carcinomas of the upper part of the abdomen (especially gastric carcinomas) occur more frequently among men than among women (table 1). In a statistical study of some 600 patients with gastric carcinoma, Abrahamson and Hinton⁴ gave the ratio as 3 men to 1 woman.

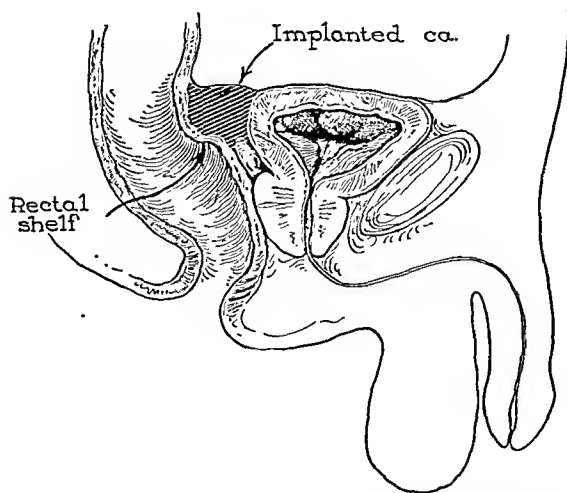


Fig. 2.—Sagittal section of male pelvis. The rectovesical space, which contains an implanted lesion productive of a rectal shelf, is represented.

Each of 8 patients in this group of 42 had first consulted a physician because of symptoms resulting from

the metastatic pelvic growth rather than because of symptoms which were referable to the primary growth. Four of the 8 had been referred to the clinic with a diagnosis of primary carcinoma of the rectum.

Proctoscopic examinations were carried out in all 42 cases; in none of them did the secondary malignant

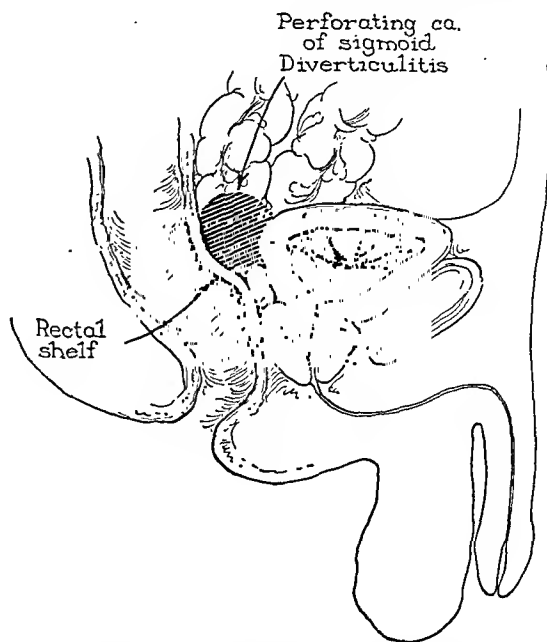


Fig. 3.—Manner in which a lesion in a redundant loop of the intestine may become fixed in the pelvis and produce a rectal shelf.

growth involve the rectal mucosa. Cases have been reported in which the process had infiltrated the rectal wall; in such instances, the resultant proliferative changes can be confused readily with primary rectal carcinoma.

Two of the 42 extrarectal masses occurred in women whose primary growth had been in the breast. The manner in which the pelvic implant occurred is worth noting. A fairly common early site of metastasis from carcinoma of the breast is the liver; it is possible that some of the cells gravitate from there. Bacon has emphasized that some authors still maintain that these pelvic metastatic growths are the result of carcinomatous emboli and therefore occur by way of the blood stream.

Lesions of the Colon and Small Intestine Causing Extrarectal Masses.—There were 58 patients in the group with this condition, or 22.8 per cent of the entire 254. Thirty-three were men and 25 were women (table 2).

All carcinomas of the sigmoid flexure were perforating and had induced an inflammatory reaction, thus causing a fixed pelvic mass. In 1 instance the primary carcinoma was in a redundant loop of the sigmoid flexure, which had become perforated and adherent in the rectovesical space, with secondary invasion of the rectum. It had caused a proliferative growth in the rectum, and, on proctoscopic examination, the lesion was considered to be a primary rectal carcinoma; at biopsy it was graded 2.

Three of the 58 patients had carcinoma of the cecum and the right portion of the colon. All these patients had a long mesentery present, and the lesion had become fixed and adherent in the pelvis.

Twenty-six of the 58 patients had diverticulitis of the sigmoid flexure which had produced perisigmoiditis and

4. Abrahamson, R. H., and Hinton, J. W.: Carcinoma of the Stomach: Review of Four Hundred and Forty-Four Cases to Emphasize the Inadequacy of Present Methods for an Early Diagnosis, Surg., Gynec. & Obst. 71: 135-141 (Aug.) 1940.

a pelvic inflammatory reaction which, in turn, had given rise to an extrarectal mass.

One of the fairly common signs in regional ileitis is the finding of a pelvic mass on digital or proctoscopic examination; this occurred in 3 of the 58 instances. At operation an involved loop of ileum was found adherent in the most dependent part of the pelvis.

Lesions of the Genitourinary System.—Blumer reported the case of a woman suffering from epithelioma of the uterine cervix who had a rectal shelf. He also mentioned the possible occurrence of similar conditions among men who had malignant lesions of the genitourinary system. In our series there were 107 patients, or 42.1 per cent of the entire 254, who had pelvic masses which had resulted from lesions of the genitourinary system. Eighty-six were women and 21 were men. Ultimate diagnoses are recorded in tables 3 and 4. Malignant lesions predominated among the men and inflammatory lesions among the women.

The chief complaint of 56, or more than half of the 107 patients, was of symptoms referable to the rectum or to the lower portion of the intestine. The most common rectal complaint was "high rectal pain." Others complained of change of bowel habits or a sensation of fullness in the rectum.

Chemical Tumors.—Treatment by injection for hemorrhoids had produced extrarectal masses in 3 of the 254 patients (1 woman and 2 men). Two lesions were diagnosed at biopsy. All 3 patients complained of constipation, rectal pain or diarrhea.

Retroperitoneal Tumors.—In this division of the 254 patients were 6 patients, all men, 4 of whom had retroperitoneal sarcomas and 2 lymphosarcomas. Two complained of change of bowel habits.

Abdominal Carcinomatosis.—This division of the 254 patients consisted of 21 in whom the primary

The diagnosis was established in 10 of the 21 cases (48 per cent) by clinical examination alone, in 1 case (5 per cent) by means of peritoneoscopy and in the remaining 10 cases (47.6 per cent) by abdominal exploration.

TABLE 3.—Lesions of the Genitourinary System Which Caused Extrarectal Masses Among Women

Malignant Lesions	Patients	Inflammatory or Benign Lesions	Patients
Carcinoma of the ovary....	14	Dermoid of ovary.....	2
Carcinoma of the cervix....	8	Cyst of ovary.....	3
Carcinoma of the uterus....	5	Endometriosis and adenomyosis.....	30
Carcinoma of the rectovaginal septum.....	1	Pelvic inflammatory disease	22
		Hydrosalpinx.....	1
Total.....	28	Total.....	58

TABLE 4.—Lesions of Genitourinary System Which Caused Extrarectal Masses Among Men

Malignant Lesions	Patients	Inflammatory or Benign Lesions	Patients
Sarcoma of rectovesical septum	1	Rectovesical fistula....	1
Carcinoma of prostate.....	13	Hypertrophied prostate	1
Epithelioma of bladder.....	2	Prostatic abscess.....	2
Carcinoma of seminal vesicle...	1		
Total.....	17	Total.....	4

Miscellaneous.—This group consisted of 17 patients, or 6.7 per cent of the series of 254; 6 were women and 11 were men. Among the women extrarectal masses were found to be caused by uterine retroversion. Three of the 11 men had had ruptured appendixes, 4 had had perforated peptic ulcers and the remaining 4 had undergone abdominal operations. Probably all of them had had pelvic peritonitis with sufficient residuums to produce extrarectal masses.

SUMMARY

Two hundred and fifty-four patients with extrarectal masses were examined in five years. They were studied with the idea of determining the cause of the mass and whether the symptoms were referable particularly to the lower portion of the colon. Of the patients, 138 (54.3 per cent) were women and 116 (45.7 per cent) were men. The patients were divided into seven groups on the basis of the primary source of the lesion. There were 135 patients (53.1 per cent) whose complaints were referable particularly to the rectum or the colon. Four had been referred to the clinic with a diagnosis of primary carcinoma of the rectum.

CONCLUSIONS

1. Our study, therefore, indicates that conditions which produce an extrarectal mass frequently will cause complaints directly referable to the rectum and will be responsible for the patient's first consultation with a physician.

2. When a rectal mass is palpated, proctoscopic examination should be done to determine whether the mass is intrarectal or extrarectal.

3. Our study indicates that the most common causes of extrarectal masses among women are lesions of the genital system. The most common causes of extrarectal masses among men are lesions of the gastrointestinal tract.

TABLE 1.—Distribution by Sex and Location of Primary Lesion in Forty-Two Cases of Implanted or Metastatic Tumor of the Recto-Uterine or Rectovesical Space

Site of Origin					Total
	Carcinoma of Stomach	Carcinoma of Pancreas	Carcinoma of Breast	Giant Cell Tumor of Bone	
Men.....	21	6	..	..	30
Women....	6	..	2	2	12

TABLE 2.—Distribution by Sex and Location of Primary Lesion in Fifty-Eight Cases in Which Lesions of the Small Intestine Caused Extrarectal Masses

Site of Origin				Total
	Carcinoma of Sigmoid Flexure	Carcinoma of Right Colon	Diverticulitis	
Men.....	14	3	15	33
Women.....	12	0	11	25

source of carcinoma was not discovered. Eight (38 per cent) of the patients were women and 13 (62 per cent) were men. All of the patients were in the fifth to the seventh decade of life. Twelve (57 per cent) of the patients made complaints referable to the rectum or the colon, as manifested by bleeding or a change of bowel habit, such as diarrhea, constipation or alternate diarrhea and constipation.

HAEMOPHILUS INFLUENZAE TYPE B
IN ACUTE LARYNGITIS WITH
BACTEREMIA

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WITH THE TECHNICAL ASSISTANCE OF MILDRED D. FOUSEK
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Pittman¹ in 1931 demonstrated that the invasive strains of *Haemophilus influenzae*, in contradistinction to the strains ordinarily found in the nasopharynx, possess a capsule. The capsule contains a soluble substance which reacts with the homologous immune serum, and on the basis of this reaction six serologic types of *H. influenzae* (A through F) have been described. Of the organisms recovered in cases of influenzal meningitis, 92 to 95 per cent² have been type B. Recovery of type B organisms from sources other than the meninges has been unusual.

The purpose of this communication is to describe 10 instances in which *H. influenzae* type B was found in cultures of the blood taken from patients desperately ill with acute laryngitis. Special interest attaches to the fact that 8 of these cases occurred within the fifteen month period from Jan. 1, 1940 to April 1, 1941,

TABLE 1.—Bacteriologic Data on *H. Influenzae* Type B
Recovered in Ten Cases of Influenzal Laryngitis

Case.....	1	2	3	4	5	6	7	8	9	10
Blood										
Ante mortem....	0	+	0	+	0	+	+	+	+	+
Post mortem....	+	+	+	+	+	+	+	+	+	+
Nasal swab.....	0	+	+	+	+	+	+	+	+	+
Pharyngeal swab..	0	+	+	+	+	+	+	+	+	+
Lung post mortem	+	+	+	+	+	+	+	+	+	+

0 = not done; + = also recovered from nasal swab in rapid typing broth; * = *H. influenzae* recovered, not typed.

whereas the other 2 were the only ones observed in this clinic during the preceding seven years. Of further interest is the constant clinical picture of high fever, shock and acute laryngitis observed in these cases. A similar clinical picture associated with *H. influenzae* bacteremia has been described in the French literature,³ but no reference to this type of infection is found in the English literature.

MATERIAL AND METHODS

The clinical material came from the pediatric service of the New Haven Hospital, which is a general hospital in a community of 200,000. The pediatric service is composed of sixty-eight beds, half of them being in the isolation pavilion, to which are admitted all patients whose illness might be considered infectious. Yearly admissions during the period 1933 to 1940 averaged 780 with a progressive increase from about 600 in 1933 to about 1,100 in 1940.

The routine examination of patients admitted to the New Haven Hospital includes bacteriologic studies consisting in cultures of material from the nose and throat,

Aided by a grant from the Fluid Research Fund of the Yale University School of Medicine.
From the Department of Pediatrics, Yale University School of Medicine, and the Pediatric Service of the New Haven Hospital and Dispensary.
1. Pittman, M.: Variation and Type Specificity in the Bacterial Species *Haemophilus Influenzae*, *J. Exper. Med.* 53: 471 (April) 1931.
2. Pittman, M.: The Action of Type Specificity in the Bacterial Species *Haemophilus Influenzae*, *J. Exper. Med.* 55: 683 (Dec.) 1931.
3. Le Mierre, A.; Meyer, André, and Laplane, R.: Les septicémies à bacille de Pfeiffer, *Ann. de méd.* 39: 97 (Feb.) 1936.

of blood and of material from purulent lesions. Extensive use is made of rabbit's blood in preparing the mediums, and the details of technic are those described by Boisvert.⁴

An additional feature of the routine examination when patients have pneumonia and, more recently, any infection of the respiratory passages or meningitis, is an attempt to make a rapid etiologic diagnosis from material obtained by nasal swab and incubated in 1 cc. of blood broth for a few hours as described by Poole and Fousek.⁵

Identification of *H. influenzae* was made on the basis of colony formation, stained smears and requirement for X and V factors in growth. Serologic classification was made by the Neufeld technic to demonstrate the presence of capsular swelling, the organisms obtained on culture and therapeutic anti-*H. influenzae* type B rabbit serum being used.

RESULTS

Data on the recovery of *H. influenzae* type B in the 10 cases reported are given in table 1.

H. influenzae type B was recovered from the blood culture in all cases. Three patients had no blood for culture taken during life, but cultures of the heart's blood taken post mortem were positive for the organism. One patient had a positive culture both during life and post mortem. The broth cultures grew out in as few as twelve hours in some cases, and in all, within twenty-four hours. Growth in pour plates was characterized by the absence of visible colony formation, but when a loopful of medium was fished from the pour plate to blood broth abundant growth took place. This diffuse distribution of bacteria in the pour plates and the occasional rapidity of growth in the broth blood cultures is indicative of quantitatively heavy bacteremia approaching true sepsis. In no case of acute laryngitis has *H. influenzae* type B been recovered from other sources and not from the blood culture.

The same organism was recovered from cultures of material from the nose and throat in 2 cases and from the nose in another. In 6 other cases, *H. influenzae* was recovered from the nose or throat or both but no attempt was made to type the organism. In the last 2 cases *H. influenzae* type B was recovered within a few hours from a nasal swab placed in rapid-typing broth shortly after the patient had been admitted to the hospital. We have not yet used the means for direct typing suggested by Alexander, Craig, Shirley and Ellis,⁶ by which these organisms have been identified from rhinopharyngeal mucus within thirty minutes. The value of this procedure in cases of laryngitis is chiefly in indicating the presence in the upper respiratory passages of an organism rarely encountered there. The application of the same method of rapid culturing in cases of meningitis has proved as successful in giving an early etiologic lead and with this disease may permit the earlier use of the appropriate antiserum.

Cultures of material from the nose and throat on Löffler's medium were negative for diphtheria bacilli in all cases. In no case were hemolytic streptococci recovered from the nose or throat. In 2 cases pneu-

4. Boisvert, P. L.: Human Hemolytic Streptococci from Diseases of Children, *Am. J. Dis. Child.* 59: 281 (Feb.) 1940.
5. Poole, F. D., and Fousek, Mildred D.: The Etiologic Diagnosis of Pneumonia in Children by Rapid Typing of Nasal Cultures, *J. A. M. A.* 115: 1854 (Nov. 18) 1939.
6. Alexander, H. E.; Craig, H. R.; Shirley, R. G., and Ellis, C.: Validity of Etiologic Diagnosis of Pneumonia in Children by Rapid Typing from Nasopharyngeal Mucus, *J. Pediat.* 18: 31 (Jan.) 1941.

mococci (type XIX and type XXXIII) were recovered from the nose and throat.

Other sources of material for culture included the tracheotomy wound and the lungs and spleen post mortem. In only 3 cases were cultures made of material from the tracheotomy wound, and in these *H. influenzae* (not typed) was recovered together with other organisms—staphylococci, *Streptococcus viridans* and *Micrococcus catarrhalis*. In 2 cases *H. influenzae* type B was cultured in material from the lungs at autopsy although there was no gross or microscopic evidence of pneumonia. In another case *H. influenzae* was recovered from the lungs and in 2 cases from the spleen. Unfortunately, these organisms were not typed.

CLINICAL FEATURES

Incidence.—The incidence of *H. influenzae* type B infections among patients admitted to the pediatric service of the New Haven Hospital from 1933 to 1940 is given in the accompanying chart. The patients are grouped as to those with influenzal meningitis, those with acute laryngitis and bacteremia and those with some other infection and bacteremia. The number seen in 1940 exceeded the total number seen in the preceding seven years. Interest in the pediatric service in this organism has been greater since January 1940, and this may be a contributing factor in the greater incidence noted during the year 1940. However, the routine practice of taking blood for culture from all patients with evidence of infection and of taking heart's blood for culture from all patients post mortem covers the entire period and would tend to minimize this factor.

Age.—The age incidence is given in table 2. The youngest patient was 4½ months of age and the oldest was 6 years and 10 months. The age was higher than that of the group with influenzal meningitis, of whom about 80 per cent were 2 years old or less, and was more that of children with croup or acute laryngitis.

Symptoms and Signs.—The clinical picture was characterized by (1) a history of severe sore throat, (2) evidence of laryngitis, (3) fever and leukocytosis and (4) signs of "shock."

1. History: Only 1 of the patients had a history of previous attacks of laryngitis. Two patients were siblings admitted on successive days; in 2 other cases there was some one in the family group with a cold but no laryngitis. Six of the 10 had a history of colds in the head preceding the onset of respiratory distress. The most striking symptom was severe sore throat, described by 1 child as a "bone in the throat" and by another as "hair in the throat." The sore throat was accompanied by difficulty in swallowing. The progression of respiratory distress was so rapid that all the patients were admitted to the hospital within six to twenty-four hours of the onset.

2. Laryngitis: Evidence of acute laryngitis with obstruction consisted of a hoarse voice, croupy cough, inspiratory retraction of the intercostal, suprasternal and infrasternal spaces and cyanosis. Direct laryngoscopic examination was done in 8 cases, and in all the appearance of the epiglottis and larynx was uniform in showing pronounced edema and redness. This picture of inflammation was described by the laryngoscopist in 1 case as follows: "The epiglottis and both vocal cords and arytenoids resembled strawberries, without ulceration or membrane." In 1 case the epiglottis was so swollen as to prevent any view of the cords or even of the arytenoids. In 4 cases the inflamed and greatly

swollen epiglottis was prominent on routine inspection of the throat and must have been the cause of the intense pain and the difficulty in swallowing complained of by the patient. One patient who did not have laryngoscopic examination performed died at home three hours after the onset of symptoms. An autopsy was done at the New Haven Hospital, and according to the pathologist's description the appearance of the larynx was nearly identical with that of patients seen during life. The other patient who did not have a direct laryngoscopic examination performed showed improvement soon after admission to the hospital.

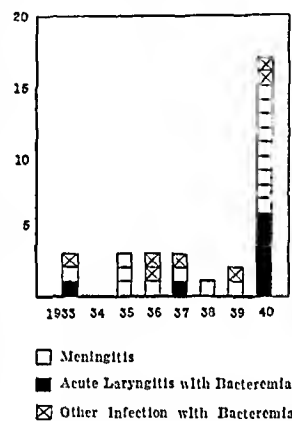
3. Fever and Leukocytosis: The temperature was elevated in all but 1 case. Two patients had a temperature between 38 and 39 C. (100.4 and 102.2 F.), and 7 patients, between 39 and 40 C. (102.2 and 104 F.). The white blood cell count ranged from 44,300 with 95 per cent polymorphonuclear cells to 7,200 with 80 per cent polymorphonuclear cells. Five patients had counts between 15,000 and 20,000. The degree of leukocytosis appeared to have no relation to the severity of the illness or to the outcome.

4. "Shock": The "knocked out" appearance of the patients has been described as shock for want of a better word. This appearance of shock seemed out of all proportion to the relatively short duration of the obstructive symptoms. The patients seemed to lack the ability to fight the obstruction, in contrast to the usual picture in croup. Several observers expressed their surprise at the degree of prostration of the patients by commenting that they did not appear to be trying as hard as they should. After tracheotomy the patients failed to show the immediate improvement which is the usual response to that procedure in cases of obstructive laryngitis. Their respiratory distress was relieved, as evidenced by disappearance of retractions, but they continued to appear prostrated and the temperature remained elevated.

Course and Duration.—One case report is given to illustrate the rapidly progressive course which was characteristic in all the cases. Three patients died within eighteen hours of the onset of severe symptoms and a fourth within forty-eight hours. The patients who recovered showed little change for forty-eight hours except for the relief of respiratory distress. Improvement after this period was rapid, and recovery was complete within a week. In 1 case the tracheotomy tube was not removed until the eleventh day.

REPORT OF CASE

G. S., a white boy aged 3 years, was admitted to the New Haven Hospital on Nov. 25, 1937 because of difficult respirations. There was no illness in the family. The boy had never had croup before. On November 22 the patient had a nasal discharge. The evening before admission he had been irritable. At 5 a. m. on November 25 he complained that his mouth hurt; this was interpreted by the parents as meaning that he



Instances of the detection of *H. influenzae* type B in blood culture and spinal fluid, 1933 to 1940.

had a toothache. Shortly afterward he began to have respiratory distress which became worse rapidly and was accompanied by cyanosis.

The patient was admitted to the hospital at 10 a. m. The temperature was 39.8 C. (103.6 F.). The boy was having acute respiratory distress with definite retraction of the supraclavicular and intercostal spaces. The skin appeared grayish. There was complete aphonia. The pharynx was dull red, and the tonsils appeared to be slightly enlarged without exudate or membrane. On each side of the neck there were felt several firm lymph nodes which were only slightly enlarged. The heart was not enlarged; there was a soft systolic murmur heard at the apex and not transmitted. The lungs were resonant, and there were no rales. The liver and spleen were not enlarged.

Direct laryngoscopic examination revealed a red, swollen glottis with a small opening. At 11 a. m. tracheotomy was done under local anesthesia. During the operation the patient stopped breathing, and, despite the immediate establishment of an adequate airway through the wound, respirations were not satisfactorily reestablished for five or ten minutes. The temperature rose steadily after the operation to 42 C. (107.6 F.) and, despite constant attempts to reduce it, remained between 40 and 41 C. until death. At 6 p. m. twitchings of the face and extremities began, and these continued despite sedation. The patient died at 8:45 p. m.

At autopsy no membrane was found in the pharynx or larynx. The epiglottis was severely edematous and pulpy, with a light

The therapeutic measures employed together with the outcome are given in table 3. Six patients recovered and 4 died, giving a mortality of 40 per cent.

The 9 patients treated in the hospital were placed in a steam tent immediately after admission. This treatment was continued until all signs of laryngitis had disappeared.

Tracheotomy was performed in 6 cases. Four of the patients recovered and 2 died. Of the 4 patients who did not have a tracheotomy, 2 recovered and 2 died. In neither of the latter 2 patients was death considered to be due to laryngeal obstruction. One of the patients had been submitted to laryngoscopic examination, and, while edema and redness of the laryngeal structures was present, it was felt that an adequate airway existed. Tracheotomy was done within two hours of hospitalization in all 6 cases, after a trial in the steam room had not resulted in improvement in the respiratory distress. In 1 case tracheotomy was done in the ward as an emergency, life-saving procedure.

Six patients received chemotherapy with one or more of the drugs of the sulfonamide series, and all these patients recovered. This group included 4 patients who had tracheotomy and 2 who did not. It was felt that patient 3, who received a single dose of 20 grains (1.2 Gm.) of sulfanilamide by rectum one-half hour before death had not received adequate therapy and should be classed as not receiving chemotherapy. Sulfanilamide, sulfapyridine and sulfathiazole were used, 2 patients receiving only one drug and the others two of these drugs given consecutively because of some manifestation of intolerance to the drug given first, e. g. vomiting, rash or delirium. The dose of each of these drugs was calculated on the basis of 1½ grains (0.09 Gm.) per pound of body weight daily. One half of this calculated dose was given as the initial dose, and then one sixth of the daily dose was given at four hour intervals. In 2 cases, the initial dose was given parenterally in the form of a hypodermoclysis of 0.5 per cent sulfapyridine sodium in physiologic solution of sodium chloride. The initial dose in the other cases and subsequent doses in all were given orally. Chemotherapy was started soon after the patient was admitted to the hospital in the last 3 cases when suspicion of bacteremia had been aroused by the clinical appearance of the patient.

Two patients received anti-H. influenzae type B rabbit serum supplied by Dr. H. E. Alexander. One of these patients had meningitis. The other patient remained extremely toxic eighteen hours after tracheotomy and adequate chemotherapy, and 10 cc. of antiserum was administered intravenously. Rapid improvement followed, but a culture of blood taken immediately before administration of the antiserum failed to show any growth, and it is most probable that the patient would have recovered without serotherapy.

SUMMARY

Eight patients with acute laryngitis and H. influenzae type B bacteremia were seen in this clinic between Jan. 1, 1940 and April 1, 1941. A recent increase in H. influenzae type B infections is shown by the fact that 17 cases of infection with this organism were encountered in 1940 in comparison with a total of 15 during the years 1933 to 1939. Speculative interest is aroused as to the possible relationship between this increase in H. influenzae infections and the epidemic form of influenza prevalent in the United States in 1940-1941. In this series of cases no clearcut relation-

TABLE 2.—Age Incidence

Age, years.....	0-1	1-2	2-5	5+
Number of patients...	1	1	3	5

TABLE 3.—Treatment and Outcome in Ten Cases of H. Influenzae Type B Laryngitis

Case.....	1	2	3	4	5	6	7	8	9	10
Steam tent.....	—	+	+	+	+	+	+	+	+	+
Tracheotomy.....	—	+	—	+	+	—	+	+	+	—
Sulfanilamide.....	—	—	—*	+	—	+	—	—	+	—
Sulfapyridine.....	—	—	—	+	—	—	+	+	—	+
Sulfathiazole.....	—	—	—	—	—	—	+	+	+	—
Antiserum.....	—	—	—	—	—	+	—	—	+	—
Result.....	D*	D	D	R	D	R	R	R	R	R

D = died; R = recovered; * = patient died at home; + = 20 grains of sulfanilamide given rectally twenty minutes before death.

pink color. The vocal cords were swollen so as to obliterate the ventricles between them. The mucosa of the trachea was deep red and pulpy, and the primary bronchi also showed a pulpy mucosa. The anatomic diagnoses were acute laryngotracheobronchitis, pulmonary congestion and edema, focal hemorrhagic pneumonia and necrobiosis of the cerebral cortex.

Bacteriologic findings, as given under case 2 in table 1, included the recovery of H. influenzae type B from a culture of the blood ante mortem and of the heart's blood post mortem. H. influenzae, not typed, was recovered in culture from the nose and throat and at autopsy from the tracheotomy wound, the right lung and the spleen and in pure culture from the heart's blood. In addition, hemolytic streptococci were recovered from the tracheotomy wound and the right lung and Str. viridans from the right lung at autopsy.

TREATMENT

Evaluation of therapy in the cases described is limited by the small number involved, but a discussion of the measures employed seems indicated by the relative frequency of such cases recently. It should be emphasized that all the patients receiving sulfanilamide, sulfapyridine or sulfathiazole therapy recovered, while all those not receiving one of these drugs died. No conclusions could be drawn regarding the relative efficacy of these drugs.

ship could be established. Dr. E. V. Turner studied 1 case in the series by the method of Smith, Andrewes and Laidlaw⁷ but was unable to isolate a virus.⁸

A review of these 8 cases, together with 2 observed in previous years, reveals a constant clinical picture of severe prostration in addition to the obstructive symptoms of acute laryngitis. The features of this picture were the abrupt appearance of respiratory distress in a previously well child without a history of croup, often accompanied by a complaint of severe sore throat probably due to the greatly swollen epiglottis. High fever, leukocytosis and the appearance of "shock" out of proportion to the duration of symptoms completed the picture. The fulminant course which the disease may run, the short period which it may take blood broth cultures to grow out and the heavy seeding in the pour plate indicate that death may truly be a septic one.

The obstructive symptoms in 6 cases were severe enough to warrant tracheotomy. That relief of the obstruction was not sufficient seems apparent from the fact that 2 patients on whom tracheotomy alone was used died, whereas the 4 patients having sulfonamide therapy in addition to tracheotomy all recovered. Two patients in whom obstructive symptoms were not so severe recovered with chemotherapy alone.

Type specific antiserum, used in the treatment of influenzal meningitis,⁹ was administered successfully in 2 cases, in 1 of which signs of meningitis had developed. For patients not responding promptly to tracheotomy and chemotherapy this may be a life-saving measure.

CONCLUSIONS

1. In 10 instances *H. influenzae* type B was recovered from cultures of the blood of patients with acute laryngitis.

2. The occurrence of *H. influenzae* type B bacteremia in cases of acute laryngitis produces a septic syndrome adding to the mechanical hazard of that disease.

3. The presence of this organism in the nasopharynx may be detected within a few hours by the use of a nasal swab culture.

4. The use of drugs of the sulfonamide series has proved a valuable means of treatment in addition to the relief of the mechanical obstruction.

5. The use of anti-*H. influenzae* type B rabbit serum is suggested for patients not responding to tracheotomy and chemotherapy.

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7. Smith, Wilson; Andrewes, C. H., and Laidlaw, P. P.: Virus Obtained from Influenza Patients, *Lancet* 2: 66 (July 8) 1933.

8. Turner, E. V.: Personal communication to the author.

9. Alexander, H. E.: Treatment of Bacterial Meningitis, *Bull. New York Acad. Med.* 17: 100 (Feb.) 1941.

Protein as Fuel.—While protein is physiologically rather an uneconomical fuel, it is nevertheless one of the substances out of which the body can get energy by subjecting it to combustion or oxidation. In starvation, after the small reserve store of carbohydrate (glycogen in liver and muscles) has been exhausted and the stores of fat in adipose tissue have been extensively drawn upon, the body will begin to burn tissue protein as a source of energy. Likewise, even when some food is taken, if the supply of carbohydrate and fatty foods is insufficient to provide the needed energy, protein foods or tissues can be used as fuel. As long as the intake of fatty food and carbohydrate-rich foods is plentiful and sufficient to cover the fuel needs, protein will not be burned merely for the purpose of providing energy but can be saved for building tissues if need be. Carbohydrates and fats are hence said to be "protein spacers."—Bogert, L. Jean, and Porter, Mame T.: *Dietetics Simplified*, New York, Macmillan Company, 1940.

Clinical Notes, Suggestions and New Instruments

LYMPHOSARCOMA: DIAGNOSED GASTROSCOPICALLY

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Sarcomas of the gastrointestinal tract were classified by Ewing¹ as (1) spindle cell myosarcoma, (2) miscellaneous round cell or mixed cell alveolar sarcoma and (3) lymphosarcoma. Lymphosarcoma is the most important type in this classification and is the most frequently seen. The fact that sarcoma seldom involves the gastric mucosa early and therefore produces no characteristic deformity of the stomach on roentgen examination makes early diagnosis difficult. This is particularly unfortunate since the prognosis of gastric lymphosarcoma treated by adequate surgical intervention and follow-up roentgen therapy seems definitely more favorable than that of gastric carcinoma.² For these reasons any procedure which may assist in the early diagnosis of this condition should be welcome.

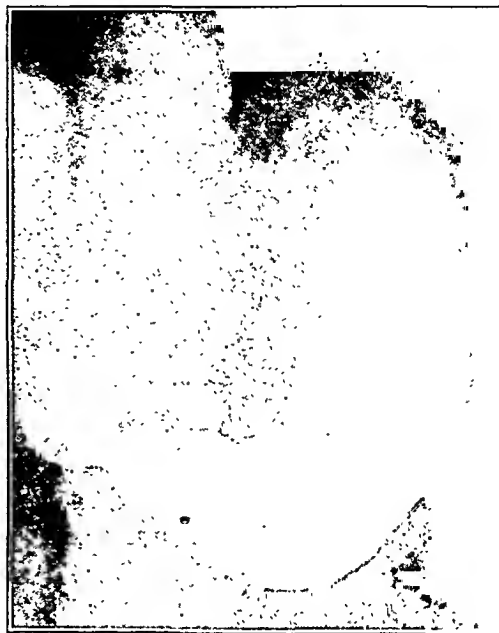


Fig. 1.—Appearance one month before gastroscopic examination. The antrum is well filled.

The following case is of interest because the lesion was diagnosed correctly by gastroscopic examination one month after roentgen examination had failed to disclose the presence of any abnormality of the stomach.

REPORT OF CASE

A man aged 58, a carpenter, presented symptoms strongly suggesting peptic ulcer. He stated that he had midepigastria distress and hunger pains which had begun the previous year. This distress had been relieved by the intake of food, and he had had a remission of symptoms for about one month preceding the onset of his recent recurrence. He had not noticed nausea or vomiting, and there had not been a change in his usual normal bowel activity. Frequently he had been awakened at night with pain, which was relieved by taking an alkaline preparation. There had not been a loss of weight, and he had continued with his usual strenuous work. When free from pain he thought he felt as well in a general way as he previously had. He stated also that he had been a consistent

1. Ewing, James: *Neoplastic Diseases*, ed. 3, Philadelphia, W. B. Saunders Company, 1928.

2. Balfour, D. C., and McCann, J. C.: Sarcoma of the Stomach, *Surg., Gynec. & Obst.* 50: 948-953 (June) 1930.

user of snuff for many years. The past history and inquiry about the system were negative, and there was no history of malignancy in the family. The patient was well nourished, and physical examination disclosed no abnormalities of consequence except for some tenderness in the midepigastrium. No abdominal mass was palpated; the edge of the liver was felt just below the costal margin and was smooth and not



Fig. 2.—Sketch of changes seen gastroscopically. Note grayish lesion in antrum, surrounded by edematous mucous membrane.

tender. Regional lymph nodes were not palpated. The temperature was 98 F., the respiratory rate 20, the pulse rate 70 and the blood pressure 122 systolic and 84 diastolic. Examination of the blood revealed 87 per cent hemoglobin, 4,600,000 erythrocytes and 11,250 leukocytes with 68 per cent polymorphonuclear leukocytes, 27 per cent lymphocytes and 2 per cent monocytes. The Wassermann reaction of the blood was negative. The urine was normal. Gastric analysis, one hour after an Ewald meal, showed 18 degrees of free hydrochloric acid and 25 degrees of combined acid, a total of 43 degrees of hydrochloric acid. The stool specimen showed only a trace of occult blood with the benzidine test. On roentgen examination of the gastrointestinal tract (on June 8, 1938) the esophagus and stomach appeared to be normal, but there was a definite deformity of the duodenal bulb (fig. 1). A repeat fluoroscopic examination was made during which a small fleck was seen indicating the presence of a duodenal ulcer. The impression was that the patient had a small ulcer of the posterior part of the duodenum. Roentgen examination of the gallbladder done at this time disclosed that it was functioning normally. Routine laboratory procedures were repeated; important deviations from the results of the previous examinations were not found.

The patient refused hospital treatment, and a strict ambulatory regimen was planned for him. The first week he seemed to note some improvement, but because the therapeutic response was not what should be expected in a case of uncomplicated duodenal ulcer, he was hospitalized and placed on strict management. He continued to have pain. He was examined with a gastroscope on July 4, and the following notations were made: The pyloric region of the stomach was well visualized. On the anterior wall and the lesser curvature of the antrum was seen a grayish irregular growth (fig. 2). No ulcerations were seen. This nodular grayish infiltration involved part of the angulus. The upper parts of the stomach showed edema and hyperemia but no tumorous infiltration. The impression was that the patient had a malignant growth of the antrum, possibly a lymphosarcoma.

The patient was again given a roentgen examination, following which the conclusion was reached by the roentgenologist that a carcinoma was present in the antrum.

The patient underwent an operation, and the following findings were noted: The lower third of the stomach was involved in a tumorous mass extending down into the duodenum. Several glands were palpated posterior to the stomach, and a mass of

palpable tissue of an indurated character was palpated through the opening in the transverse mesocolon—probably the tail of the pancreas. The liver was enlarged and somewhat congested but had perfectly rounded margins. The gallbladder and bile ducts were apparently normal. The head of the pancreas was also apparently normal. Posterior gastroenterostomy was done because of involvement of the duodenum. An indurated lymph node was removed for biopsy.

The biopsy specimen (fig. 3) was examined in the department of pathology of the University of Minnesota and was identified as lymphosarcoma. The postoperative course was without incident, and the patient was subsequently given fifteen treatments of 150 per cent erythema doses of high voltage roentgen therapy. The patient showed considerable improvement; he gained 10 pounds (4.5 Kg.) over a period of two months and continued to feel well until the middle of February 1939, at which time he again complained of midepigastric distress and was given further roentgen therapy. He continued to feel fairly well until about two months before his death, which occurred on June 3, 1940. Permission for postmortem examination was refused by his family.

COMMENT

I had studied a case of lymphosarcoma gastroscopically with Schindler,³ and because of the remarkable resemblance of the appearance of the infiltration the correct conclusion had been reached that the lesion seen in this case was probably a lymphosarcoma. The following conditions were to be considered in the differential diagnosis in this case: carcinoma, hypertrophic gastritis, hyperplastic noncancerous tuberculous,

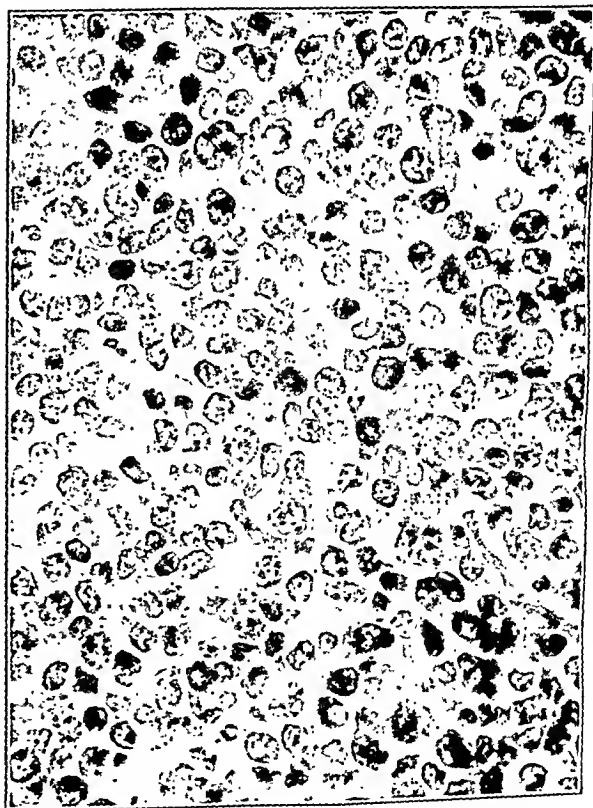


Fig. 3.—Biopsy specimen of omental lymph node, showing lymphoblastomatous cells.

gumma and other granulomatous infiltrations. Generally a carcinoma is ulcerated and presents extensive necrosis with a crater which is filled with blood coagula and has ill defined margins. Carcinoma also generally shows decided changes in color.

3. Schindler, Rudolf: *Gastroscopy*, Chicago, University of Chicago Press, 1937. Renshaw, J. F.: *Lymphoblastoma of the Stomach*, J. A. M. A. 107: 426-428 (Aug. 8) 1936.

Hypertrophic gastritis usually will not present difficulty,⁴ but cases have been reported in which benign hypertrophic gastritis simulates a tumor. Generally, however, the hypertrophic condition is not so circumscribed and the "tumor" is not so grayish or "gelatinous" appearing. Gumma does not have distinctive characteristics as seen gastroscopically, but a positive reaction of the blood serum would assist in the diagnosis. Tuberculosis of the stomach has not been observed gastroscopically.

It is of interest to note the similarity of this patient's complaints to those found in cases of peptic ulcer.⁶ This is not unusual and has been reported by others. The proximity of the submucous plexus of nerves to the sarcoma is responsible for pain being a prominent feature. This patient did not have nausea or vomiting. Pyloric obstruction⁷ is unusual, although the lesion is found most commonly along the lesser curvature of the stomach and in the antrum. Total excision of the lesion followed by high voltage roentgen therapy is the desired goal in treatment.

Review of this case definitely suggests that gastroscopic examination may be of value in the diagnosis of lymphosarcoma if the examiner has the condition in mind. It confirms the fact that gastroscopic examination is indicated in any case in which gastrointestinal complaints persist without satisfactory explanation or without definite diagnosis.

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RECURRENT SCARRING PAINFUL APHTHAE

AMELIORATION WITH SULFATHIAZOLE IN TWO CASES

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A rare but typical form of recurrent, scarring, painful aphthae is recognized under many names, one of which is periaidenitis mucosa necrotica recurrens.¹ Cases of such aphthae are all alike and like nothing else, but their cause, which I think must be a specific one, is entirely unknown. Three cases were reported by Sibley² in 1899 as of "neurotic" origin, and Sibley cited Jacobi as having described 3 cases in 1894. These are the earliest reports I have found.

Commencing as a small nodule within and beneath the mucous membrane of the lip, cheek or tongue, a lesion increases in size, sloughs and causes severe pain, becomes a crateriform ulcer with inflamed, firm borders, runs a course uninfluenced by local treatment and eventually heals, leaving a soft, pliable, depressed, whitish scar. Several lesions may be present simultaneously. The patient, suffering over a period sometimes of many years, can scarcely swallow during exacerbations. He seeks help, generally without any success whatever despite the ingenuity of numerous consultants, and shows a mouth with many scars to the sympathetic practitioner, who knows the better the wider his experience is that he can indeed do little to give relief.

REPORT OF CASES

CASE 1.—Mrs. S., a white woman aged 35, seen in July 1940, had had ulcers in her mouth since the age of 16 or 17, and they had been present almost constantly during the past four or five years. At times the pain caused by them was so extreme that she could not eat. She had received many kinds of treatment, including local efforts, injections and extraction of all teeth, with no benefit. Figure 1 shows her scarred tongue. Similar atrophic scars were seen in the mouth on the lingual side of the lower lip, the buccal mucosa, the tonsillar pillars, the soft palate and the uvula. She had one active lesion. Knowing nothing better to do, I gave her intrauta-

neously the contents of a vial of smallpox vaccine and prescribed troches of ethyl aminobenzoate. Having been vaccinated successfully many years before, she responded to this vaccination with only an itchy papule which disappeared within a week, a typical immune reaction. Such a vaccination is often notably successful in preventing recurrences of herpes simplex; sufficient cross immunity has resulted to relieve the sufferer



Fig. 1 (case 1).—Scarred tongue.

from recurrent herpes for from six months to two years in my experience. In this case, however, it did no good.³ A second vaccination was given by her home physician, Dr. J. L. Post, late in July, again without benefit. Solution of potassium arsenite was tried, but a dose of 5 drops three times a day caused her eyelids to swell, and during the five weeks from July 2 to August 7 three new ulcers developed. Empirically, I suggested sulfathiazole, which was given by Dr. Post in a dose of 1 Gm. four times a day from August 10 until August 30, at which time the patient reported by mail: "So far the sores in my mouth are fewer and comparatively smaller. . . . Altogether I took three dozen tablets. . . . I am greatly encouraged for I do not have any large bad places like you saw." I suggested increasing the dose, for studies of the blood, and the clinical opinion of Dr. Post indicated that she tolerated the drug satisfactorily. She took 1.5 Gm. four times a day for four days during September to a total dose of 24 Gm. Her mouth healed completely "for the first time in four or



Fig. 2 (case 2).—A, appearance of tongue before treatment; B, appearance after five days' treatment with sulfathiazole, 0.5 Gm. three times a day.

five years," and was asymptomatic for two months. Then the disease recurred. I suggested a course of 0.5 Gm. four times a day for seven days. With this dose the lesions became smaller, but new lesions continued to appear.

CASE 2.—Mr. B., a white man aged 26, seen Dec. 2, 1940, had one ulcer on his tongue (fig. 2, A) and numerous scars on

4. Schindler, Rudolph: Gastritis Simulating Tumor, *Am. J. Digest. Dis.* 6:523-527 (Oct.) 1939. Giere, C. N.: Gastroscopy—Role in Private Practice, *Southwest. Med.* 24:115-119 (April) 1940.

6. Keys, S., and Walther, W. W.: Lymphosarcoma Simulating Duodenal Ulcer, *Lancet* 1:1169-1170 (May 15) 1937. Eusterman, G. B., and Balfour, D. C.: The Stomach and Duodenum, Philadelphia, W. B. Saunders Company, 1935.

7. Madding, G. F., and Walters, Waltman: Lymphosarcoma of the Stomach, *Arch. Surg.* 40:120-134 (Jan.) 1940.

1. Sutton, R. L.: Periaidenitis Mucosa Necrotica Recurrens, *J. Cutan. Dis.* 29:65-71 (Feb.) 1911.

2. Sibley, W. K.: *Brit. M. J.* 1:900, 1899; cited by Sutton, R. L., Sr., and Sutton, R. L., Jr.: *Diseases of the Skin*, ed. 10, St. Louis, C. V. Mosby Company, 1939, p. 1491.

3. Woodburne, A. R.: Herpetic Stomatitis (Aphthous Stomatitis), *Arch. Dermat. & Syph.* 43:543-547 (March) 1941. Woodburne thought the disease under discussion to be a form of herpetic stomatitis and reported favorable response to intracutaneous vaccination with smallpox vaccine.

the oral mucous membranes. He had had ulcers about once in two months on the average during the past year and a half. I prescribed sulfathiazole in doses of 0.5 Gm. three times a day. The response was prompt and gratifying, for five days later the ulcer showed good clinical improvement (fig. 2, B), and the patient reported relief from pain within forty-eight hours after starting the drug. His lesion healed satisfactorily. Late in December a new sore commenced but soon disappeared without treatment. In March 1941 a full fledged ulcer appeared, but similar use of sulfathiazole produced the same effect of aborting the lesion and giving relief from pain.

CONCLUSION

In 2 cases of recurrent, scarring aphthae, sulfathiazole was beneficial in relieving soreness of the lesions and promoting prompt healing. Sulfathiazole did not prevent recurrences, however, but it gave comparable relief a second time. A large dose works better than a small one. I know no other treatment as effectual.

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A FOLLOW-UP REPORT ON RHEUMATIC SUBJECTS
TREATED WITH SULFANILAMIDE

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The use of sulfanilamide to prevent hemolytic streptococcus infections and recrudescences of acute rheumatism in persons known to be subject to rheumatic fever has given encouraging results. The observations by Thomas and her collaborators¹ working with adults in Baltimore, and observations on children in New York² indicated that a level of sulfanilamide in the blood of about 40 micrograms per cubic centimeter maintained throughout the school year protected against streptococcal pharyngitis and rheumatic recrudescences. One factor that it was impossible to control in the New York study was the increasing age of the group. Between 1936 and 1939 many of the children passed puberty, and, as is well recognized, rheumatic subjects tend to have fewer recrudescences in adolescence than during childhood. It was therefore possible to regard the increasing age of our patients as largely contributory to the decreased incidence of rheumatic fever.

One way of determining whether increasing age was significant in our results was to withdraw sulfanilamide from the patients who received prophylactic doses in the period 1936-1939. This we did during 1939-1940 to a group of 100 patients, mostly adolescents. None of these hundred patients had had streptococcal pharyngitis or manifestations of rheumatic activity while they received sulfanilamide. Since the prophylactic doses have been discontinued the patients have lived in the same environment and have received the same clinical and laboratory examinations as previously reported.³ Thirty-two of these 100 patients contracted hemolytic streptococcal pharyngitis during the first twelve months following the withdrawal of sulfanilamide, and in 40 per cent of these untreated, infected patients rheumatic fever developed. This incidence of streptococcal infection was the rate expected for our clinic patients; the incidence of rheumatic recrudescence following infections was perhaps moderately less than was expected for a similar group of rheumatic children under the age of 12 years.

These follow-up observations show that the rheumatic children who escaped streptococcal infection and rheumatic activity while receiving sulfanilamide prophylactically between 1936 and 1939 were still susceptible in 1940 to both streptococcal pharyngitis and rheumatic fever. It seems justifiable, therefore, to conclude that the absence of rheumatic recrudescence in the

sulfanilamide-treated subjects previously reported was due to the drug and not to a change in susceptibility. It is also clear that the prophylactic effect of sulfanilamide does not exert any beneficial effect beyond the period of treatment.

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SENSITIZATION TO THIAMINE HYDROCHLORIDE

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The widespread use of thiamine hydrochloride parenterally makes this report of acquired sensitivity to the substance of some clinical interest.

REPORT OF CASE

A white married woman aged 72, who had no prior history of allergic symptoms, was advised by her physician in September 1940 to take thiamine hydrochloride subcutaneously each day for ten days. This was administered in 25 mg. doses, and at the expiration of the ten day period the interval was increased to seven days. Eight injections were given, one each week, when she was advised to discontinue medication. The patient felt so well that she consulted a physician in a different city and discussed the possibility of continuing thiamine, since she had had such definite benefits. He acquiesced and gave her weekly injections of 25 mg. for eight or ten more doses. The patient fell and fractured the left radius at this time, and the thiamine was continued at weekly intervals until the latter part of April 1941.

In February 1941 the patient noticed that soon after leaving the doctor's office she sneezed violently several times. This occurred after each injection of thiamine, but she was under the impression that some substance in the physician's office was responsible for her reaction. There were no marked local reactions, but occasionally the site of injection would itch for several hours. The same sensation was felt frequently in sites of previous injections.

When visiting in another city during the latter part of April 1941 the patient allowed ten days to elapse before reporting for her injection of thiamine. About thirty minutes after treatment her eyes and lips became edematous, large urticarial wheals appeared over the body and a feeling of tightness was experienced in the chest. She became very dyspneic and cyanotic, and there was audible wheezing. Epinephrine was given within a few minutes, and at the end of five or six hours the entire reaction had subsided.

I was then consulted to determine the cause of the severe reaction. An intradermal test was done with the commercial preparation of thiamine which had been used throughout the course of injections, and a large urticarial wheal resulted. Passive transfer was made to a nonallergic individual, and at the end of forty-eight hours the sensitized sites reacted strongly when the same preparation of thiamine was introduced.

In order to rule out the possibility of a reaction from some preservative used in the commercial preparation, a solution of thiamine hydrochloride in water was prepared without the addition of any other substance. This produced exactly the same type of reaction as the commercial preparation in both the patient and the sensitized areas of passive transfer.

COMMENT

The patient obviously was not sensitive to thiamine at the beginning of treatment. Since the injections were given at intervals of about seven days, the latent or incubation period was not exceeded and only minor reactions were experienced. When the interval was increased to ten days, this period was exceeded and a constitutional reaction ensued.

The immunologic response was identical with that experienced with well known sensitizing proteins such as horse serum.

The clinical importance is apparent. It is demonstrated that thiamine hydrochloride given parenterally is capable of sensitizing human beings. Subsequent injections of this material which exceed the latent period can produce anaphylactic shock. Thus it seems advisable to make intradermal tests with thiamine hydrochloride before administering it, particularly to patients who previously have received thiamine.

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SYMPOSIUM ON MEDICAL PREPAREDNESS

The articles which follow are part of a series read at the annual session of the American Medical Association in Cleveland, June 3, 1941. The remaining articles in the series will appear next week.

THE MEDICAL PROFESSION AND
MEDICAL PREPAREDNESS

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The part of the medical profession in the National Defense Program is an important one. Without health, participants in industrial production and members of the armed forces become liabilities rather than assets. The American workman loses on an average eight work days a year from illness, the aggregate number of such days so lost reaching the astounding figure of three hundred and forty million, or more than a million work years a year. The armed forces of the United States during World War I suffered a loss of six million, eight hundred thousand work days from venereal disease. These staggering totals on two fronts alone graphically indicate the size and the importance of the task that confronts American medicine. The vast amount of highly specialized, scientific knowledge accumulated by the medical profession in relation both to prevention and to cure of disease is capable of enormously enhancing the strength and momentum of industrial and military effort. With this end in view the medical profession through many agencies is actively engaged in a program of medical preparedness in order that it may render our country the best possible service in its defense of our democratic way of life. The responsibility of the profession may be said to rest in three categories: the provision of service to the armed forces, the provision of service to industry and the continued care of the civilian population. The American Medical Association, through its House of Delegates, appointed in June 1940 a Committee on Medical Preparedness to "establish and maintain contact and suitable relationship with all governmental agencies concerned with the prevention of disease and the care of the sick, in both civil and military aspects, so as to make available at the earliest possible moment every facility that the American Medical Association can offer for the health and safety of the American people and the maintenance of American democracy." At the request of the Surgeon Generals of the Army, Navy and Public Health Service the American Medical Association through its Committee on Medical Preparedness undertook as a patriotic duty and at its own expense a survey of the medical personnel of the United States and its possessions to determine the number of physicians available for service in various capacities and to develop facts that would be useful in aiding the profession to render the greatest possible service in any national emergency that might develop.

Among the objectives which the committee hopes and expects to ascertain as fully as possible through this nationwide survey are (1) the number of physicians

licensed to practice medicine, (2) the number capacitated for active service and the number of those incapacitated, (3) the number and location of physicians who may be qualified and available for service with the military forces of the nation and for other essential governmental services in case of national emergency, (4) the number available for service to the civilian population under emergency conditions, (5) the availability and qualifications of those who can serve acceptably in special fields of medicine, (6) the number and identity of physicians qualified for teaching and research who are believed to be essential for the proper maintenance of educational institutions and (7) the number and identity of physicians already engaged in governmental service. When the questionnaire, with which all of you are familiar, was finally approved and prepared for distribution, a copy was sent with explanatory statements to every physician in the United States, its territories and possessions whose names and addresses were available. The total number of questionnaires distributed is in excess of a hundred and eighty thousand, of which one hundred and fifty thousand, four hundred and seven, or 82.9 per cent, had been filled in and returned by physicians in the United States as of April 1, 1941. Of the physicians in the territories and possessions, one thousand, five hundred and seventy-one have returned their questionnaires as of April 1, 1941, a return of 31.7 per cent. While completed questionnaires are still being received, it may be that the total number of returns will not be greatly increased. The questionnaires returned by individual physicians have been checked and edited as rapidly as possible for the purpose of transferring data to punch cards so that the information may be easily and readily available in various combinations for official agencies and for other essential purposes. On April 1 of the current year one hundred and thirty-eight thousand, two hundred and sixty-three punch cards had been prepared and the process will be continued until fully completed. Listings of various groups in the profession and of specialists in various fields of medicine have been partially prepared and will be completed when all available data have been assembled. Independent scientific organizations, including those composed of specialists, have given most valuable aid in an attempt to determine the availability and qualifications for special services. This is the first time in the history of our country that an effort has been made to obtain a record of each individual physician based on the character of his practice and his qualifications. A knowledge of the number, age, location, qualifications, availability and other characteristics of all members of the medical profession is essential in order that the total personnel resources can be utilized in intelligent preparation, appropriate assignment and adequate services for the armed forces, expanding industry and the civilian population. If the information secured is properly utilized, it should be

possible to provide necessary medical service for the military forces now on duty and for expanded forces in case of increased emergency with the least possible interference with the needs of the civilian population and of those of essential medical institutions.

INDUSTRIAL MEDICINE AND HYGIENE

The provision of medical service to industry assumes important and difficult proportions. Modern military activity depends basically on the efficient coordinated industrial production. No other factor associated with the current campaigns has been so forcibly impressed on our public consciousness. It finds greatest expression in the efforts now being made by our governmental, industrial, labor and military leadership to make available material sufficient for national defense. In warfare as now waged, the mental and manual work of twelve (to state the proposition conservatively) is necessary to maintain one effective combatant in the field. Loss of working time by indispensable skilled craftsmen then must be regarded as wartime casualties equal in importance to those which occur in actual combat. The same careful mobilization of medical and hygienic resources will be required to keep them under control. To every physician who indicated active participation in industrial medical activity in reply to the questionnaire of the American Medical Association Committee on Medical Preparedness an additional inquiry has been directed, designed to acquaint the committee with the special qualifications which individual practitioners possess and also certain details about industrial medical facilities which they command. Once these data are collected and tabulated, it will be possible to enumerate with considerable accuracy all physicians who have established competence in this field. These for the most part are the men and women who limit their work to or give special attention to one or another of the various aspects of industrial medical activity and who constitute the membership of national and local societies devoted to industrial medicine, surgery and hygiene. It is on this group that we must depend at the outset, not only to continue their customary services directly applied to the worker, but as consultants, teachers and administrators, local or regional as the emergency requires. Sufficient information has been accumulated defining quite clearly that actual shortages exist in medical personnel capable of such immediate service. In view of these limitations in qualified personnel, two steps seem practical and logical. The first is that physicians in industry should not be assigned to services of strictly military nature unless special experience, training or previous commitments make such a procedure unavoidable. The other is that it becomes imperative to explore all available opportunities for instruction in the special technics of industrial medicine and hygiene, to the end that an adequate reservoir of well trained physicians and hygienists may be regularly available. Physicians working in the industrial field are highly competent in their own special jobs, but as far as munitions are concerned they are as a whole untrained.

The primary need in the present emergency is an increase in the number of physicians and engineers qualified in industrial health and medicine and their further training in the requisites for control of the hazards of war industries. Among the avenues of approach to the problem being employed are: (a) A survey to determine the present and future needs for

men trained in industrial health and medicine. (b) An estimate of the facilities that are now available for training in industrial health and medicine and the development of additional facilities for this purpose, inclusive of the nature of the training that will be required, its scope and length of time. Coordination of the work of the subcommittees on industrial health and medicine and on medical education of the Health and Medical Committee of the Federal Security Agency with that of the Council on Industrial Health of the American Medical Association and of the various national associations of industrial physicians and surgeons. (c) The development and application of measures for protection against occupational hazards. This phase of the work includes questions pertaining to safety measures of various kinds, the solution of toxicologic and engineering problems, the protection against noise, fatigue and so on. (d) Plans for the promotion of environmental sanitation and other health questions pertaining to housing projects in connection with existing and new industrial plants.

It is of the utmost importance that the needs for medical service to the civilian population be carefully safeguarded while supplying the armed forces and industry with medical personnel. Some central agency with authority to make decisions would be most helpful in determining and defining civilian needs as well as designating those physicians essential to such. In World War I many communities were deprived of medical service because of the patriotic urge on the part of members of the profession to enter the service. It is fully as patriotic to accept designated home duties and quite as essential that the medical wants of civilians be met and, further, that those physicians supplying such be relieved of any presumed odium because of their absence from the armed forces.

DEFERMENT OF MEDICAL STUDENTS

Since the passage of the Selective Service Act the medical profession has been keenly aware of the possible disruption of the classes of medical schools, of the faculties of medical schools and of the staffs of hospitals by the strict application of its provisions. Since there are no exemptions other than for ministers of the gospel and divinity students and no provision for mass deferments beyond July 1 of this year, the deferment of medical students and doctors within the draft age became a responsibility of the individual draft boards. The number of these boards is in excess of six thousand and, as each is autonomous, unanimity of action in maintaining an adequate supply of doctors could not be expected. Doctors are quite as essential to the defense program as planes, tanks, machine guns and combat troops. A bottleneck in their production would be as disastrous as a bottleneck in any other defense industry. While the number of medical graduates, five thousand three hundred a year, seems reasonably adequate to meet the normal needs of the civilian population, the much higher ratio of medical personnel required by the military services (6.5 per thousand as compared to about 1.5 per thousand for the civilian population) produces an annual deficit in available physicians. If medical students are withdrawn from school for a year of military training as enlisted men, the flow of medical graduates will be retarded. Medical students who are inducted for a year of service as enlisted men will have discharged their obligation in connection with military service and cannot be required to accept another year

of service after graduation. The medical profession does not ask exemption for its students but does request deferment of service until completion of their medical education, when their services in all phases of the defense program will be of infinitely greater value. It does ask exemption for its members who hold key positions in medical schools, on hospital staffs, in industry and in civilian life, since their duties in their present positions are indispensable in the national defense program. It is essential to medical preparedness that a continuing supply of physicians be sustained, and the maintenance of this supply is directly dependent on the operation of the medical schools of this country with full quotas of students. The civilian and federal hospitals of the country require the services of recently graduated medical students as interns, such internship being a part of the training of physicians, and in many states has become a requirement for licensure. The medical profession welcomes and endorses a policy of deferment from military training of individual medical students recently proclaimed by Brig. Gen. Lewis B. Hershey, Deputy Director of Selective Service. In announcing the Selective Service policy of deferring medical students who are making satisfactory progress in their professional training, General Hershey's memorandum to state directors stated:

There are no replacements for medical students who are withdrawn from school. Consequently, if the supply of medical students who are to be graduated into the medical profession is reduced through their induction to serve in a nonprofessional capacity, an increasing reduction of physicians available for military service as well as an aggravation of the increasing over-all national shortage will result. It is of paramount importance that the supply be not only maintained but encouraged to grow, and that no student or intern who gives reasonable promise of becoming an acceptable medical doctor be called to military service before attaining that status.

THE HEALTH AND MEDICAL COMMITTEE

With the approval of the President, the Council of National Defense on Sept. 19, 1940 established "as a subordinate body to the Council a committee to be known as the Health and Medical Committee," its members being Dr. Irvin Abell, Chairman, the Surgeon General of the Army (Major Gen. James C. Magee), the Surgeon General of the Navy (Rear Admiral Ross T. McIntyre), the Surgeon General of the United States Public Health Service (Dr. Thomas Parran) and the chairman of the Division of Medical Sciences of the National Research Council (Dr. Lewis H. Weed). The committee was given the responsibility of advising the Council of National Defense regarding the health and medical aspects of national defense and of coordinating health and medical activities affecting national defense. It was granted authority to utilize to the extent that such facilities are available for such purpose the laboratories, equipment and services of the Medical Department of the Army and Navy, of the Public Health Service and of other government institutions; and, within the limits of the appropriations allocated to it, to contract with and transfer funds to such institutions and to enter into contract and agreements with individuals or educational or scientific institutions for studies, experimental investigations and reports. On Nov. 28, 1940 the Council of National Defense, by executive order of the President, transferred the Health and Medical Committees to the Federal Security Agency, of which Mr. Paul V. McNutt is the adminis-

trator and coordinator. To fulfil its duties of coordinating health and medical activities, affecting national defense, the Health and Medical Committee appointed six subcommittees which represent large sectors of medical interests. The Subcommittee on Dentistry has, through the American Dental Association, undertaken the listing and classification of all dentists and has under discussion the provision of dental services for the civilian population surrounding industrial centers and military establishments. The Subcommittee on Medical Education has discussed the possible modifications of the medical curriculums which may be advisable or necessary to meet an increased demand for qualified medical personnel. It has also been interested in securing deferment of military service for medical students in good standing in approved medical schools and deferment of military service for interns.

The Subcommittee on Hospitals has also considered the status of interns and residents in relation to the Selective Service Law. It has pointed out the need of beds for the hospitalization of neuropsychiatric and tuberculous patients brought to light by the examinations of the draft and induction boards. The Subcommittee on Negro Health considered fundamental health problems affecting the Negro and the availability of Negro physicians for service with the armed forces and emphasized the need for scholarships to encourage and aid Negro medical students. The Subcommittee on Nursing with the aid of the Public Health Service and the American Red Cross is making a national inventory of nursing personnel with the aim of supplying the armed forces with nursing service and at the same time affording continued service for the civilian population. The Subcommittee on Industrial Medicine has been busily engaged with the problems of industrial health and medicine and has made a real contribution in this field.

The Health and Medical Committee requested the National Research Council to establish committees on aviation medicine and neuropsychiatry as these fields could be more appropriately handled by its Division of Medical Science. The airplane as a technical machine has been developed to a point beyond the resistance of the human machine that operates it, bringing to the fore medical problems for solution, while psychiatric and neurologic disturbances take on an added importance during war time. In order that scientific knowledge of medical problems related to defense both in its military and in its industrial aspects may be extended, the Health and Medical Committee has sought the aid of the National Research Council and of the National Institute of Health of the Public Health Service in the special fields of professional advice and research. Both institutions are making important and extremely valuable additions to the medical preparedness program.

The cooperation of the civilian profession is paramount in the formulation and completion of the medical efforts in the preparedness program, one which the leaders of the nation hope will insure peace but which will insure readiness should the grave responsibilities of war come. Except for the battle casualties, the health and medical problems will reach the same magnitude. The medical profession by education, experience, tradition and moral obligation is prepared to accept now, as it has in the past, the protection of the health of all the people, whether in the military establishment or in the civilian population.

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THE NATIONAL RESEARCH COUNCIL AND MEDICAL PREPAREDNESS

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It is now slightly over a year since the Division of Medical Sciences of the National Research Council established the first committees which were to act in an advisory capacity to the Surgeon Generals. The inauguration of this advisory activity came as a result of an initial request from Surg. Gen. James C. Magee that the division give advice about certain medical problems, particularly regarding the administration of the newer chemotherapeutic agents and regarding the treatment of surgical shock. This request of General Magee's was promptly discussed with the officers of the Medical Corps of the Navy and of the Public Health Service, and general agreement as to the desirability of such advisory committees was obtained. It seemed quite appropriate that the Division of Medical Sciences should be asked to serve in this advisory way to the armed services. The National Research Council was established in 1916 as the operating agency of the National Academy of Sciences under the congressional charter of the academy. Through the World War the council functioned as the Department of Science and Research of the Council of National Defense and also as the Science and Research Division of the Signal Corps. At the end of the war in 1918, President Wilson issued an executive order requesting the academy to perpetuate the National Research Council. As a quasigovernmental institution the council, like the National Academy of Sciences, then became permanently established as an agency to give advice to the government "on any subject of science or art." This statement, in its general nature, shows the broad scope of activity, and as a continuing scientific body the council of course stood ready to assume the duties requested of it by the Surgeon Generals.

With the establishment of the first two committees, one on chemotherapeutic and other agents and one on transfusions a year ago, many problems relating to other branches of medicine were early presented by the representatives of the Surgeon Generals, and it was quickly realized by the civilian members and by the medical officers that additional committees covering other sectors of medicine would be needed if the council was to meet the requests for advisory services. Hence, in addition to the first two groups, main committees covering the fields of medicine, surgery and information were established during the early part of the summer of 1940. Many technical subcommittees were organized under the main committees and promptly met the tasks assigned. The correlation of the activities of the many advisory bodies made greater and greater demands on the office of the Division of Medical Sciences, and it became necessary for the chairman of the division to devote full time to these duties in Washington. Soon thereafter Dr. S. V. Larkey and Dr. E. H. Cushing were added to the office force; and they too are continuing to put their full energies into the administrative end of the undertakings of the advisory committees.

During the late spring and early summer of last year it became apparent that correlation of medical efforts in the national defense should be effected through some sort of coordinating body. On Sept. 19, 1940 the Council of National Defense created the Health and

Medical Committee, charged with responsibility "to coordinate health and medical activities affecting national defense." As you all know, Dr. Irvin Abell was appointed chairman of this committee: the other members were the three Surgeon Generals and the chairman of the Division of Medical Sciences, National Research Council. This group promptly undertook the coordination of activities in medical affairs relating to the national defense. At an early meeting of this committee the National Research Council was requested to appoint two further committees, one on aviation medicine and the other on neuropsychiatry. These committees were appointed by the Division of Medical Sciences and became functional in the early fall. Later the Health and Medical Committee on Nov. 28, 1940 was transferred to the Federal Security Agency and was placed under Mr. Paul V. McNutt as "Coordinator of Health, Welfare and Related Defense Activities."

The appointment of the chairman of the Division of Medical Sciences, National Research Council, as a member of the Health and Medical Committee related the advisory committees of the council to the general coordinating body. This indirect relationship was considered to have definite advantages, as the committees remained as quasigovernmental bodies rather than as direct offsprings of the Health and Medical Committee. In this way it was felt that the nonmilitary medical point of view could be presented in best fashion to the Medical Corps.

With the transfer of the Health and Medical Committee to the Federal Security Agency, the sum of \$250,000 was made available for the purposes of the coordinating committee. Of this total, \$100,000 was designated as for administration; the remaining sum of \$150,000 was marked for support of medical research. Transfer of balances for the administrative account to the research item in the budget was permitted, but no transfer from the research funds to administration was allowed. The Division of Medical Sciences received from these monies available to the Health and Medical Committee appropriations in the following amounts: \$50,000 for the purpose of preparation of special reports, committee meetings (including travel expenses) and so on, \$60,000 for the support of projects in medical research, particularly in the field of aviation medicine and \$7,050 for the support of two specific projects in aviation medicine. To these appropriations of \$117,050 should be added a refund to the National Research Council in the amount of approximately \$9,900. This recapture represented the cost of travel and of committee meetings held in the interval between Sept. 19, 1940 (date of establishment of the Health and Medical Committee) and Jan. 2, 1941, at which time the initial appropriation of \$50,000 became available by contract. In total, then, the National Research Council in its Division of Medical Sciences has received from the Health and Medical Committee of the Federal Security Agency contract authorizations to the total of approximately \$127,000. From the appropriations available for research (\$67,000) the division promptly made a number of allocations to institutions in order to secure inauguration and prosecution of medical research projects essential to the national defense. Unfortunately, because of technical difficulties, payments on the contracts for these investigations were not made until less than one month ago, and in consequence much of the research was not undertaken as promptly as would have been desirable. It is hoped that no further difficulties will retard the payments under

the contracts drawn up between the Federal Security Agency and the National Research Council.

So, at the end of this year of activity in the Division of Medical Sciences, it would seem interesting to appraise the work accomplished by the various committees in the fields of professional and research advice. It is not possible here to review extensively all the accomplishments, which I believe are real, but reference should be made to the number of important recommendations regarding therapeutic procedures, particularly in chemotherapy and in treatment of venereal and tropical diseases. These recommendations were accepted by the Medical Corps of the Army and Navy and have been distributed to the officers in the form of circular letters. The value of these directives is undoubted; the reports represent a significant contribution on the part of civilian medicine. Aside from the recommendations regarding therapeutic procedures, the committees have assisted in revising the regulations setting the standards for the physical examinations of recruits. These regulations, adopted by the War Department for use in every induction center, were published in pamphlet form (MR 1-9) and have constituted also the standard for examination of all recruits by the Selective Service System in the local boards. Even after the original edition of these regulations was published with the many amendments suggested by the committees of the Research Council, further revisions have constantly gone forward. These further recommendations emanating from the committees and subcommittees will be included in the next edition of the regulations to be issued shortly after July 1.

A further activity of the committees has been to lay out research programs covering medical problems of vital interest to the Medical Corps and directly related to the national defense. These medical problems in part have been presented by the liaison officers and in part have originated in the technical subcommittees. Many of these investigative projects have received approval of the main committees as representing essential research undertakings. The list of these research problems is large and the expenditure called for, both in government and civilian laboratories, is far beyond the sums made available during the present fiscal year for the purpose. Again, it is hoped that these essential questions in military medicine can be worked on with adequate financial support by the government; their solution will represent an important contribution to the national defense program.

While most of the research projects remain unfortunately unsupported at the present time, a few definite research undertakings have been pushed forward as the result of the energy and foresight of the committees. Some of these projects have gone forward in civilian laboratories without any federal support; others of the investigative undertakings, particularly in aviation medicine, have received small grants through the Health and Medical Committee and the work is now going forward. Two important projects relating to aviation physiology were referred by this coordinating body to the National Defense Research Committee, of which Dr. Vannevar Bush is chairman; they could be accepted for study by this NDRC group, as they represented development of instruments of warfare. All in all, the record in research is one of minor accomplishment, but, considered from other standpoints, the record represents a civilian contribution of some significance to the national welfare. Every effort has been made to secure the cooperation of university laboratories in much needed

research, and the future should be a much brighter one if ample support is provided during the next fiscal year.

In the general setup of the committees advisory to the Surgeon Generals within the Division of Medical Sciences, National Research Council, thought was properly given to the relationship of these undertakings to the activity of the American Medical Association. Early in 1940 the Association had established under the chairmanship of Dr. Irvin Abell a Committee on Medical Preparedness; this committee, at the request of Surgeon General Magee, assumed the most important task of assembling a complete roster of the medical graduates and registered physicians of the United States. The committees of the Research Council in no way invaded the field of activity of the Committee on Medical Preparedness—rather were the council's committees prepared to cooperate thoroughly regarding the undertakings of the American Medical Association. Through interlap of membership, a close correlation has been achieved. Thus in one significant respect the committees of the Research Council, in cooperation with the Committee on Medical Preparedness, have undertaken to supply certain evaluations of professional and administrative abilities to the Surgeon Generals through the records of the American Medical Association. In this work Dr. James E. Paullin, Dr. Frederick A. Collier and Dr. Harry A. Steckel in particular have carried a heavy load, but the results achieved have been of vast usefulness. Such information as has been forthcoming is placed on the roster card of the physicians and will be used by the Surgeon General of the Army through the Chicago offices of the Association.

In addition to cooperative procedures with the Association's Committee on Medical Preparedness, the Division of Medical Sciences has carried out certain studies which are of particular interest to the Public Health Service and to the armed services. These surveys relate to the control of venereal disease in areas adjacent to the military establishments and to the venereal disease control programs of the various states in which large concentration of troops in training occur.

The American Red Cross has made use of the facilities of the Division of Medical Sciences and of its advisory committees in two important enterprises. The American Red Cross and the Research Council were asked by identical letters of the Surgeon General of the Army and the Surgeon General of the Navy to assume responsibilities in regard to the procurement of human blood plasma for the armed forces. In this cooperative venture the Red Cross undertook to recruit the donors for the blood, to provide all necessary collection equipment for the bleedings, to transport the citrated drawn blood to processing centers, to centrifuge the blood and to store the resultant plasma in refrigerated chambers. The Division of Medical Sciences was asked to supply the professional advice and professional supervision for the collection of blood; this is being done through a subcommittee of the main Committee on Transfusions. The project has gone forward with success after initial organization in New York City and is now extending, as facilities for centrifuging and drying are developed, to the larger cities of the East. There is every prospect of rapid expansion of the activities to the other larger centers in the country—in the Midwest, the South and the Far West. The Army and Navy have contracted for the drying of the plasma as furnished by the Red Cross and will ultimately be equipped with the large quantity necessary for use in cases of shock, hemorrhage and burns.

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A second request to the National Research Council from the American Red Cross related to the evaluation of the personal and professional qualifications of those applying for service with the Royal Army Medical Corps or with the Emergency Medical Service of Great Britain, in response to the appeal for a thousand physicians from the British Red Cross to the American Red Cross. In this cooperative undertaking with the American Red Cross, the Division of Medical Sciences has arranged for the desired determination of the qualifications of the candidates; and while the work of the volunteers has been all too small, the work of the Research Council's committee, headed by Dr. O. H. Perry Pepper in medicine, to Evarts A. Graham in surgery, to Walter B. Cannon in transfusions, to Morris Fishbein in information, to Eugene Du Bois in aviation medicine, to Perrin H. Long in chemotherapy, and to Winfred Overholser in neuropsychiatry—a great debt of gratitude for effective service is due; and to the chairmen and members of the many subcommittees a similar debt exists. Likewise in a slightly different way many universities and institutions have lent the services of their men to the Research Council; the men thus lent are devoting full time or part time to this defense work. The cooperation and unstinting service of these many physicians and of the institutions form the brightest record of the year for the National Research Council in its endeavor to be of aid in this period of national emergency.

integration and support of medical research on problems vital to the national defense.

And I cannot close without expressing the thanks of the Division of Medical Sciences, National Research Council, to those many busy physicians and surgeons who have given so freely of their time and energy to those tasks within the council which grew out of the requests for aid from the Surgeon Generals. Especially to the chairmen of the seven main committees—to O. H. Perry Pepper in medicine, to Evarts A. Graham in surgery, to Walter B. Cannon in transfusions, to Morris Fishbein in information, to Eugene Du Bois in aviation medicine, to Perrin H. Long in chemotherapy, and to Winfred Overholser in neuropsychiatry—a great debt of gratitude for effective service is due; and to the chairmen and members of the many subcommittees a similar debt exists. Likewise in a slightly different way many universities and institutions have lent the services of their men to the Research Council; the men thus lent are devoting full time or part time to this defense work. The cooperation and unstinting service of these many physicians and of the institutions form the brightest record of the year for the National Research Council in its endeavor to be of aid in this period of national emergency.

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THE ROLE OF INDUSTRIAL MEDICINE IN MEDICAL PREPAREDNESS

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"This war is going to be one of endurance. The weapons of sea power and industrial strength work silently, and only at rare intervals do they attract the headlines." These words of Lord Halifax give special prominence to the contention that the skilled worker has become of importance equal to that of the man under arms. Loss of working time by skilled and indispensable workers, no matter what the cause, must be classed in war times as casualties which require the mobilization of medical facilities for competent handling just as do those which occur in the field. This fact was brought before the medical profession and the public by the House of Delegates last year when the importance of medical service to the industrial worker was stressed and every facility of the American Medical Association was offered for the health and safety of the American people and the maintenance of American democracy.

This report of the activities of the Division of Medical Sciences over the past year is necessarily incomplete and in some ways hardly gives the true picture of the value and extent of the committees' activities. It is my feeling that the most important achievement of these committees is that of establishment of friendly and intimate relations with the various officers of the two Medical Corps who are stationed in the Surgeon Generals' offices. Thus close contact with the important executives of the Medical Corps has been of great service, both to the committee members and, I hope, to the Medical Corps. The record then becomes one of some achievement and of efforts expended fruitfully in the inevitable turmoil which accompanies the expansion of peace time organizations into war time enterprises. Those of us who have been close to the work of the main committees and the many technical subcommittees of the council have felt no permanent discouragement, and there is prospect that a record of achievement for the next twelve months will be much brighter and much more encouraging to all of the medical profession. To gain this desired goal, medicine and medical research will necessarily have to be related much more closely to the main defense activity, and large sums of money must be made available for the

In our industrial population the loss of time from work due to illness and injury amounts to over 340,000,000 days a year or considerably over 1,000,000 work years each year. Annually there are approximately 17,000 occupational deaths from accidents, 70,000 permanent disabilities, and 1,400,000 temporary disabilities. Many problems arise from diseases peculiar to certain occupations, and with the present industrial expansion the development of new hazards is to be anticipated. Industrial workers have higher rates of physical defects than do nonindustrial workers, and this excessive mortality is especially notable among unskilled workers. The amount of time lost from general illness is fifteen times as great as the total lost from both accidents and occupational diseases. The problems of industrial medicine are much the same in war as in peace. Such differences as occur are mainly of degree or intensity of emergency conditions. The solution

should not be hurriedly improvised but should be an integral part of our national life. The care of workers during illness cannot be considered as merely an instrument of production to be administered by industry or government. It is a medical service in which the patient-doctor relationship should be one of mutual confidence and self respect. The medical problems of industry may be expressed in terms of objectives which, in the industrial medical field, have long been considered to be (1) the determination of physical and mental fitness for work, (2) the promotion of employee health and efficiency, (3) the instruction of the worker in healthful living and (4) reduction of lost time due to illness and injury.

Preemployment and periodic health examinations have not made extensive progress, but the stimulus of the present emergency with the accentuation of industrial health should lead to a widespread development of this important medical measure. The importance of proper labor relationships must be recognized as essential to the success of any effort to extend physical examination programs. In the past, organized labor has objected to programs of physical examination and more particularly to periodic health examinations. These objections have in part been based on the fear that medical information so obtained may be used unfairly. This fear is not entirely without foundation in experience and is the expression of a normal reaction. It must be recognized as an integral part of this problem. The important contributions to the health and efficiency of workers to be derived from periodic medical examinations need no emphasis. As Dr. Parran has stated, it is wasteful for industry to train a highly skilled employee over long months only to have him break down suddenly with tuberculosis, mental disease or some crippling condition.

The objectives of physical examination in industry should be to keep the worker fit, to place him in a job where he can do his best work without harm to himself or to his fellow workers, to detect communicable disease and to refer him to his own doctor for needed treatment. The handicapped worker should be rehabilitated.

The problems of industrial hygiene may be attacked from two angles: first, the hygiene of the individual and, second, the hygiene of the environment in which he works and lives. The first problem is a proper function of the medical sciences, while the working environment has to do largely with engineering practices. It is the province of the medical profession to diagnose diseases and primarily to recognize the existence of such diseases as may be due to the working environment. Based on the conclusions of the physician, the engineer learns what unhealthful conditions should be investigated and what control measures are to be initiated. It is essential, therefore, that the various professions understand clearly the functions of each and approach the solution of the problems of industrial hygiene as a joint effort and cooperate with one another to the fullest extent.

The medical problem may best be approached by grouping physicians in industry into full time industrial physicians and part time and on call physicians. Approximately 85 per cent of workers are employed in small plants in which there are no organized medical services. Services to these industries are supplied by private practitioners including specialists in various fields, some of whom have made important contributions to industrial medicine. The medical departments of large industrial plants serve as models of efficiency

and have demonstrated their worth. The problem confronted by these departments in large industries in the present emergency is largely one of expansion of existing facilities. The fact that medical service to 85 per cent of our workers is predominantly in the hands of private physicians presents an important problem of co-ordination of effort. In large industries the relatively few full time men who are specialists in industrial medicine have engaged chiefly in measures for the prevention of occupational disease and the promotion of health. Opportunities of a like nature and probably on a larger scale exist in small manufacturing establishments and are available to physicians who render services to these plants. These practitioners have, in the past, limited their industrial activities largely to the treatment of occupational injuries and diseases and have failed to a considerable degree to see the opportunities afforded by industrial hygiene.

Since its organization in 1937 the Council on Industrial Health has been active in stimulating the contributions which the physician, individually and through medical organizations, can make to the industrial workers. It has also stimulated the formation of committees on industrial hygiene in state and county medical organizations and has clearly outlined a program which can be adopted by the state and local societies. Among the objectives of this program are (1) the training of physicians to recognize and report occupational diseases, (2) the training of industry and labor to the value of industrial health conservation, (3) the elevation of medical relations and standards in workmen's compensation, (4) a scrutiny of all social legislation affecting industrial health, (5) a clarification of relationships between industrial and private practitioners, (6) the improvement of relations between physicians and insurance and (7) the establishment of working relations with all state agencies interested in industrial health. The need for cooperation between all interested agencies, both official and voluntary, is plain. The private practitioner, either as an individual or through the state or local medical organizations, should utilize to the fullest extent the services which may be rendered by official agencies in this field. In order to accomplish their objectives, public health workers in industry and in the various government services must make a genuine effort to aid in the development of industrial health services through the agencies of organization of the private physician. No program of a public health nature can be carried to its logical conclusion without such coordinated effort. In the past there has too often been obvious failure to effect such cooperation. This failure must be recognized and surmounted if the best interests of the industrial worker are to be served.

The reduction of lost time due to illness and injury is dependent to a large extent on a clear understanding of the causes underlying these factors. Such an understanding can only be based on accurate and adequate statistical studies of the cause of absenteeism. While excellent studies in this field have been made, notably by Lanza and Vane for the Air Hygiene Foundation, the problem of sick absenteeism is still a complex and elusive one. The figures of eight plus days a year per male and twelve plus days a year per female have emerged as average figures. This is five times greater than the figures for industrial accidents. While it is recognized that the most frequent cause of sick absenteeism is outside of employment, the estimates are necessarily crude because reporting is inadequate. It is

probable that the yearly absence from work due to occupational disease is only a fraction of a day. These absences are more important in some industries than they are in others. The short term disabilities, namely those under eight days, are of the greatest concern, particularly those resulting in one, two and three day absences. It is obvious that this type of sick absenteeism is not remedied by rigid standards of physical examination for even in the army where men are hand picked and under constant medical supervision there is a definite incidence of absenteeism. The public health interest in this problem is apparent by the tremendous incidence of influenza in the recent epidemic, when it was estimated that 64 per cent of the total national population had colds. Commander Stephenson has recently emphasized the fact that the most important single contribution which can be made in this field is reporting. He states that this is illustrated by the fact that we know almost nothing of what happens in trivial accidents in which men lose from fifteen to fifty minutes. By making a study of these small claims and of their causes he believes that the naval industrial organizations alone would save thousands of man hours yearly. Without question the same is true to a much larger extent in many small industries now active on national defense problems.

The Federal Security Administrator is coordinator of all health, medical and related defense activities. He has appointed a committee known as the Subcommittee on Industrial Health and Medicine, which functions through the Health and Medical Committee of the Council of National Defense. This subcommittee is pursuing its work of coordination with these two objectives in view: (a) the integration of all federal and state voluntary organizations such as the Council on Industrial Health of the American Medical Association, the American Association of Industrial Physicians and Surgeons, the American Industrial Hygiene Association and the Section on Industrial Hygiene of the American Public Health Association to the end that an organized program in the field of industrial health can be applied to the national defense industries and (b) the promotion of a demand for more complete health services in the small, as well as the large, defense industries. The Council on Industrial Health of the American Medical Association is assisting this subcommittee by registering all physicians qualified in the field of industrial health or who have indicated a desire to take up industrial medicine as a career regardless of training or lack of training and experience. This subcommittee held a joint meeting with the Council on Industrial Health in Chicago in January 1941, at which time a joint committee was formed to make recommendations to the Health and Medical Committee covering industrial hygiene needs of national defense. These recommendations were endorsed by the Health and Medical Committee, and proposals with reference to the expansion of the Division of Industrial Hygiene of the Public Health Service were promptly put into effect. Funds for special researches were made available to the Health and Medical Committee and specific projects are now being prepared. It is important to emphasize the fact that the proposed program specifically recommends that the Division of Industrial Hygiene of the National Institute of Health should develop in cooperation with the state authorities and the committees on industrial health of the state medical societies a definite program of instruction designed to acquaint the practicing medical profession with the

fundamentals of industrial medicine and designed to carry into effect the minimum standards set up to protect the health of employees.

As time goes on it becomes increasingly clear that elevation of standards of medical practice in industry will improve in direct proportion to the amount of interest expressed by medical agencies closest to industry, namely in state and county societies. Up to the present time satisfactory progress has been made in the organization of these groups for service of this type. There need be no change either in our system of practice or in our organization for practice in this field. Rather there is need for the establishment of effective working relationships between official agencies and our voluntary medical organizations. The adequate application of all related sciences is necessary, and these must be articulated with the work of the general physician.

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MEDICAL PROBLEMS PECULIAR TO THE NAVY AND NATIONAL DEFENSE

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WASHINGTON, D. C.

In keeping with the address of the President of the American Medical Association, I wish to outline what the Navy Medical Corps is doing to prepare itself to meet all the obligations that will be thrown on it. It is well for all of us periodically to make a searching inquiry into the things we have done and then from the lessons so learned lay future plans. It is in this spirit that we in the Navy await the coming years.

The primary duty of the Medical Corps of the Navy is to make all preparations humanly possible to keep the personnel healthy and able to perform their duties with minimum time on the sick list. The Navy is made up of the Fleet, with its supporting shore stations. It is reasonable then to say that every move made by the Medical Corps is in the direction of advancing the efficiency of the Fleet. We in the Navy have a precise problem. It takes years to build a battleship. It takes many months to build a destroyer. Consequently, we can plan ahead for the requirements that will be placed on us in caring for the personnel needed to man the ships that the Navy will have a year from today.

The Marine Corps is a small, compact, mobile outfit. Here again we are able to forecast in a definite measure what its needs will be a year from today.

When the present emergency came on us the Navy Medical Corps consisted of approximately eight hundred and seventy-five regular officers on active duty. It is not easy to procure unlimited increases for our service except in time of a national emergency. Today our Navy and Marine Corps consist of over three hundred thousand officers and men on active duty. Our medical officer strength is on a basis of sixty-five one-hundredths of 1 per cent of the entire officer and enlisted strength of the Navy. In view of this, two thousand medical officers will be necessary to care for the increased personnel already in prospect. How then are we to make up the apparent deficiency? The answer is simple but still difficult. It is from you, the medical profession of our country, and from the graduates of our class A schools that we turn for reenforcement. The Navy Medical Corps is

extremely desirous that nothing be done which will hinder the steady flow of medical education. I am glad to be able to tell you that the Secretary of the Navy is doing all possible to help in this regard.

It has been encouraging for us to receive the generous response and cooperation from the men in civil life who are members of the Medical Reserve Corps. We now have over five hundred of them on active duty. A number of them are in vital key positions. Except for a small number, who had obligated themselves for active duty whenever called, all gladly volunteered.

We have a Reserve of which we are proud. Included in it are our specialist units. Of these there are one hundred and eleven scattered through the length and breadth of the land. The purpose of these units, in time of war, is to move them into our hospitals, take over as the heads of departments and allow the regular officers to proceed on duty at sea. We are being careful not to disturb these units as yet. In a few instances some officers have requested active duty and this has been granted. They have been told, however, that in case of mobilization they will be relieved of the duty assigned them and returned to duty with their specialist unit.

In view of the rapid and ever changing type of warfare, the Navy is looking well ahead to make its medical services extremely mobile. We have organized, and will organize, more mobile neurosurgical units. These will be complete in every sense of the word and will be moved by air to any focal point when needed. We have also organized several mobile laboratory units. These will operate in the same manner. Our large type mobile base hospital has now passed the experimental stage. This is a hospital of five hundred beds and is able to carry on the work of any five hundred bed permanent institution. We learned a great deal in the setting up of the first unit, which at one time cared for over two hundred and forty patients in the Caribbean area. We plan by the end of this year to have four such hospitals ready for service at any point where they may be needed. We have the smaller hospital unit with our field forces. These are well equipped units of seventy-five beds each.

Consider the geographic distribution of the Navy's activities. The Medical Department is responsible for the health and sanitation of every station, whether it be in the Philippines, in the Caribbean, in Newfoundland or in Alaska.

The specialization that our Corps has carried out through the years in tropical diseases now stands us in excellent stead. We are glad to acknowledge at this time the splendid cooperation of the Rockefeller Institute. This fine organization has offered its services to both the Army and the Navy in the various foreign countries where they operate so well and where we may possibly go.

We are calling on the Public Health Service for aid and advice in many sanitary matters and are receiving it. We are indeed fortunate to be able to secure many men in civil life who are specialists in public health and preventive medicine for commissioning in our Reserve Corps. Several of these are now on duty in the Caribbean area.

Coming closer to the home situation, our industrial plants in navy yards are causing us considerable concern regarding procurement of the necessary medical officers who are properly prepared for duty in industrial medicine. There are not over twelve hundred men considered capable by the American Medical Association

of carrying out the work in industrial medicine satisfactorily. A number of our large institutions have established excellent courses in this specialty which will add to the supply of specialists in this field. It is to be hoped that many men in civil life will take advantage of these courses, as the need will be enormous in not only the military and naval services but in our industrial sections as well.

The problem of ventilation is uppermost in our minds at this time. When we consider the present day form of warfare at sea, we know that every compartment on every ship must be ventilated at some time by artificial means. The stamina of fighting men will be tremendously impaired if they must rest or sleep in poorly conditioned compartments while waiting their turn to go on watch and take up the work where their companions left off. Air conditioning, as we know it, is not wholly satisfactory, and our complaint in the Navy is that all of the apparatus is too bulky and too heavy for our present use. Here is a problem that must be solved.

You might draw the conclusion from what I have said that our problems are insurmountable, but let me assure you they are not and that the health of the Navy today is splendid. On the brighter side of the picture we are carrying out the lessons we have learned from the research done by our various organizations in this country. The entire personnel of the Navy will be immunized against tetanus during the coming year. All personnel going into the tropics are being immunized against yellow fever. In our recruiting we are working along satisfactory lines in weeding out the mentally unfit. Our personnel coming into the Navy is being roentgenographed in an effort to screen out all tuberculous individuals. We are proceeding rapidly in the instruction of our medical officers and hospital corpsmen in the newer therapeutic measures of chemotherapy. We are profiting by the lessons learned abroad in the prevention of surgical shock. In this last condition there is much to be done, and here research is proceeding at a reasonable pace.

The Naval Medical Service has a wide and varied field. The work in our hospitals is not particularly different from that in civil institutions. There is no reason why it should be. Of course, our patients are under much better control than those in a civil hospital, for the individual is kept in the institution until he is fit to return to duty. Our Navy personnel knows that when a man is sick he can go to his doctor and receive immediate attention. He has no fear of doing this, for he knows that the sooner he reports the sooner he will be well and able to resume his duties. The average Navy enlisted man makes the finest patient a doctor could possibly wish for and is cooperative to the last degree. He is well indoctrinated in the reasons for preventive measures in sanitation and is instructed in the simpler methods of first aid. The attempt is made by these means to give the enlisted man information that will help him to understand why preventive measures are so necessary, since time on the sick list means disrupting various task organizations, such as gun crews. These men take tremendous pride in the excellence they are able to bring about by team organization.

The practice of medicine on board ship is a complex affair. The medical officer may be by himself with a crew of eight hundred to nine hundred men, hundreds of miles from any other ship. He must assume the responsibility for the medical and surgical care of his entire crew. This officer must be well grounded in the

problems of the diagnosis and treatment of disease. He must be able to do satisfactory emergency surgery and he must have a knowledge of military hygiene and sanitation.

Specialization is encouraged in the Navy but not until after the medical officer has had enough time to discover the problems that meet the doctor in general practice. We find that he makes a much better specialist. Once he has started in a specialty he is given every opportunity to continue in it, and when he comes ashore he is sent to a station where his specialty can be made use of. Frequent postgraduate instruction in civil institutions is provided for all our doctors. One thing, however, that must never be lost sight of is the fact that a doctor in the Navy Medical Corps must always be a specialist in military medicine.

Turning to the more highly specialized side of military medicine, we have an ever expanding field in aviation medicine. Here again the speed of our aircraft is forcing us into research. The matériel side is far ahead of the personnel. All are familiar with the fine work that has been done in solving the problem of the diver. By means of research we are now able to keep men at work for periods of twenty minutes or more at depths beyond 250 feet. We are turning that experience to excellent use in attempting to solve the problem of how a pilot can live above an altitude of 37,000 feet and function efficiently. The field of atmospheric hygiene is one which will call for all possible ingenuity that man can muster. We have the ever present problem of fatigue which is tied in with altitude flying. He who answers the question "What is fatigue?" will do man the greatest possible service. The Navy is in search of that answer.

So then the Medical Corps of the Navy adds to its varied fields the long neglected one of research. True we have done a certain amount, but it has never been well directed. We must turn to our civilian friends for help and guidance in this task. Speed is again essential. Time—there is not enough time to do the things that we need to do, but they must be done if our aviators are to succeed where others have failed.

The question of research and where it properly falls in national defense is now in the process of being solved. The military services must take a prominent place in this work, as many of the experiments must be carried out at army posts and on naval stations. Neither service has done enough in this important field to have well balanced research staffs. It is necessary then for the services to call in men from civil life who have given their lives to research and who know how to proceed so that time will not be wasted and results will be obtained without overlapping and confusion.

It is our idea that research in surgical shock should be carried out in many institutions at the same time. Experience gained by what has gone on in Europe helps us frame our program. The greatest difficulty to be faced over there is the lack of control of patients and a satisfactory follow-up system. We should have but little trouble along those lines and, given a few months to check carefully the cases under observation, some definite conclusions should be forthcoming. Here again I wish to emphasize the great need for speed; realizing, of course, that there is a great difference between haste and speed.

I have deliberately avoided the field of social hygiene. This much I can say: The Navy is cooperating in every way with state and local authorities wherever our activities are located. We are appreciative of the

advice and help we are receiving from our civil organizations and from our committees set up by the Research Council.

So to the young doctor let me say that the Navy can offer a career where he can do as fine professional work as he has the desire to do. Every opportunity is given to the man who wishes to succeed. Make no mistake, the naval officer never becomes wealthy but his pay is adequate. There is a comradeship throughout our service that will give lasting pleasure to any who may join us. This may sound like boasting, but it is not. It is a sincere expression of one who counts hundreds of friends made through the years, and, regardless of how long the gap may be between contacts, the pleasure on meeting again is still as keen as in the beginning.

To the older men who may join our Reserve, in case of national emergency, we welcome you and count on the aid and experience that your many years in civil life will bring to us.

Our hope today is that the members of the American Medical Association will think of our Navy Medical Corps as an integral part of American medicine. It is our endeavor to see that you are not disappointed.

THE FUNCTION OF PUBLIC HEALTH IN DEFENSE

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WASHINGTON, D. C.

We are meeting at a grave hour in our nation's history. Our Commander-in-Chief has laid on each of us the obligation to contribute our unlimited effort in this "unlimited national emergency." No group of equal size can do so much for the nation's safety as can the medical profession.

It becomes increasingly clear that this total war basically is a war of production. It is a war in which the totalitarian system of economics, no less than its political system, is pitted against the democratic. Unless we excel Nazi efficiency in our defense efforts, we shall not survive as a free people. Our machines are the best in the world. It is our task to make our men as good as our machines. In many skills we have already a shortage of manpower. To conserve and improve our manpower is a medical and public health task of national importance.

An obvious first point of attack against needless loss of manpower is in industry itself, particularly in the defense industries. Neal and Bloomfield of the Public Health Service have estimated that three hundred and fifty million man days were lost last year on account of illness and accident among industrial workers. This means more than one million men working for a full year. Not all of this loss can be prevented; but suppose we prevented 10 per cent of it—a conservative estimate—what would be the result in defense production? Based on data from the Bureau of Labor Statistics, showing the man-hours required to produce various kinds of war material, I have calculated that a 10 per cent reduction in industrial manpower losses from disability would build twelve cantonments of average size, or five battleships, or sixteen thousand, four hundred and seven combat tanks. And how urgently we need them now! Representative McCormack, of Massachusetts, recently made another comparison. He estimates that man-days lost to industry

last year on account of disability was fifty times as great as that lost on account of strikes and lockouts. We hear much about the latter but little of the former.

For a quarter century the Public Health Service has been studying health problems in industry, gaining the confidence of labor and management alike through the scientific dispassionateness of its findings. Since 1935 too we have aided thirty-six states to set up divisions of industrial hygiene. During the past year we have supplemented their work with fifteen teams of experts (a doctor, an engineer and, when needed, a chemist) to survey health hazards in war industries and prescribe corrective measures. Strong help is being given by the American Medical Association Council on Industrial Health under Dr. Seeger's chairmanship, and by Dr. Selby's Federal Subcommittee on Industrial Health and Medicine. This is a beginning, but only a beginning, toward the maximum industrial health efficiency which we must have.

In every war the venereal diseases have been a serious drain on military efficiency. We are much better prepared now than ever before to deal with this problem. With federal aid under the Venereal Disease Control Act of 1938 there are in operation more than three thousand treatment centers and more than two thousand diagnostic laboratories. Every state distributes free drugs to all physicians for the treatment of their patients. As a part of the physical examination of every recruit for the army under Selective Service, a serologic test for syphilis has been made. The state and city laboratories have done most of the work with federal aid. Never has this been done before in this or any other army. Among the first million men, 48,000 cases of syphilis have been found. Of these only 3 per cent show clinical syphilis. Among the second million draftees in the World War there was seven times this amount of clinical syphilis. In other words, in 1917 clinical syphilis caused the rejection of approximately ten thousand men; now the number is one thousand, four hundred and eighty-two per million.

The data are not yet complete on gonorrhea, but preliminary figures show only about one third as much now as in the first World War.

These facts are heartening but give no cause for complacency. Here are forty-eight thousand young men, otherwise able to serve their country, who are not exercising this privilege of free citizenship because of syphilis. Of particular concern is the fact that present treatment and follow-up machinery in many places has broken down under the strain of this added case load. If we have the will and the funds to deal aggressively with the infectious cases uncovered by Selective Service examinations, we can add thousands of men to the armed forces and advance by a decade control of the venereal diseases.

Other preventable diseases and correctable defects, uncovered by draft examinations, bring home to us for the second time the poor health status of our young men. General Hershey last week said that while more careful examinations may account for the apparent increase in some defects since the first World War—better examination for syphilis is an example—dental disabilities today definitely are greater than in 1917-1918. He estimates that poor nutrition accounts directly or indirectly for one third of the rejections.

As a nation what are we to do with this reservoir of manpower unavailable for the armed services? I urge that the government offer or, if necessary, require corrective treatment where it is indicated.

This is not, however, a fundamental approach to developing our maximum manpower. All signs point to a long war ahead. The public health and medical professions should draw the blueprints now for early nationwide action to put all our knowledge to work for the benefit of the nation.

Implicit in such a program is an equal opportunity for health. We Americans want good health to be the heritage of all, on as democratic a basis as the suffrage itself. We need this heritage now for the nation's safety. We shall need it later if we are to have the fruits of the peace we seek to win.

Until we put all our knowledge to work to provide an equal opportunity for health as the birthright of every American, we have small cause to boast that our medical education is the best in the world, that we have more and better hospitals, doctors, research institutions than any other country.

On one broad health front, blueprints for nationwide action were drawn last week in Washington, following months of preliminary work, at the National Nutrition Conference for Defense, called by the President. I commend to every doctor a careful study of them. Agriculture, science, industry, the professions and government, each has an important part. Time permits me to quote only a brief excerpt as to the goals:

These broad recommendations are made as the basis for a national nutrition policy and an action program that can reach down to every community and if possible every individual in the land in the present emergency. But the conference also wishes to put on record its belief that such a policy and program have implications that go beyond the present emergency.

There seems no reason to doubt, on the basis of present evidence, that just as, by the use of modern medical science, we have conquered diseases that took an enormous toll of life in the past, so by the use of the modern knowledge of nutrition we can build a better and a stronger race, with greater average resistance to disease, greater average length of life and greater average mental powers.

This can be done by the conquest of hunger—not only the obvious hunger man has always known, but the hidden hunger revealed by the modern knowledge of nutrition.

The United States is probably the best fed nation in the world today, but we cannot afford to judge ourselves by external standards. We should judge ourselves by the standard of our own potentialities—our resources in food, in technical developments, in scientific knowledge. By that standard we fall far short of our goal.

No nation, certainly no great nation, has ever truly conquered hunger, the oldest enemy of man. Such an aim is not too high, such a goal is not too difficult, for the people of the United States. It is in line with our tradition of pioneering on new frontiers. It is a particularly fitting task for us in this day when democracy should point the way to a new and better civilization for oppressed peoples all over the earth.

The part of the Public Health Service in nutrition for defense illustrates a principle that is more characteristic of that service, I believe, than of any other governmental agency. We have certain definite legal functions, but many of our tasks, perhaps the more important ones, are shared with others. Our cooperative health work with the states is an example. The health program of the National Youth Administration is another. With the help of the Public Health Service, the National Youth Administration is providing health examinations and needed corrective medical care for a group of underprivileged youth who are being trained in defense skills and who will be liable to the draft in the next years.

In two hundred defense areas the sudden influx of workers or soldiers, or both, has produced health problems beyond the ability of the community to meet. Almost over night a village of a few hundred has a fifty-fold population increase. The state health departments and the Public Health Service have mobilized every available resource into these critical areas to meet elemental sanitation and disease control needs. There is still no federal help, however, for building the hospitals, the water supplies, the sewerage systems and schools, or for draining the malarious swamps. Yet three months ago the President asked that Congress authorize these community facilities.

Up to now we have adopted no adequate plan either to insure a continuing supply of doctors in the future or to utilize to best advantage the doctors we have. Modern war produces a shortage of many skills. This was obvious when I was in Great Britain. The skill in which they have the greatest shortage is that of the doctor. They have asked us for one thousand young American doctors. The President has endorsed their request. Yet we have not met this, an urgent British request for aid. Here is a concrete opportunity for American medicine. Do we dare fail?

To meet our own military and civilian needs for doctors will require careful rationing of our medical resources. We can do such national planning only through an official, responsible committee, which with the aid of state and local committees should decide the task for which each doctor is best fitted. The largest proportion of volunteers come from the rural areas, where they can least well be spared. Also defense work of understaffed health departments is being curtailed or stopped, because they are losing trained doctors, with no replacements to be had. Our military and naval forces number about two million. In this total war, the health care of the remaining one hundred and twenty-eight million is of equal importance.

Public health action stems from scientific knowledge welded in the laboratory of medical research. To research must action return for future guidance. In the future as in the past the greatest contributions of the Public Health Service lie in its research work. All of the energies of the National Institute of Health are being directed toward the solution of health problems of prime defense importance. Aviation medicine, new industrial health problems in war industries, typhus fever vaccination, protection against yellow fever, an improved chemotherapy for malaria are some examples. The aid of all our medical research centers is needed in a coordinated attack on those problems of importance alike to military and civilian efficiency. Through the Health and Medical Committee, under the wise guidance of Dr. Irvin Abell, such a coordinated attack has been started.

Recently I studied the problems of civil defense in Great Britain. Two weeks ago a civilian defense agency was created by the President. The British experience teaches us that health departments, with the aid of the medical profession, are at the heart and center of their gallant effort. You may be sure that our own health and medical profession soon will be called on for a large role in our own preparations.

These, then, are some of the functions of public health in total defense. Let us together perform them well.

There are historic moments in the life of every nation, as in the life of every individual. This is such a moment. We have passed the twilight of a day that is gone. One

by one the lights of liberty have been extinguished in many lands. Few lights remain. But for America a new day is dawning. For it we shall need all the health and courage we can muster. We must be conscious of our destiny, of a potential power which no nation has ever held. How well we use it now may determine the course of our history. Our part—yours and mine—is to work as a united profession toward building our country's strength. Our nation expects much of us. We shall not fail.

Special Article

GLANDULAR PHYSIOLOGY AND THERAPY

THE ASSAY OF GONADOTROPINS AND OF GONADAL HORMONES

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As in other physical states, the goal of therapy in gonadal dysfunction is to reproduce a normal condition in an abnormal body. This requires quantitative knowledge of the normal concentration of the hormones concerned in the body tissues and fluids and quantitative knowledge of their concentration in the agents used for replacement. In both cases the development of suitable assay procedures is essential.

The problem is not simple. Biologic methods, with all their attendant difficulties, must still be used in assaying many of these principles. Metabolic processes may alter certain of the substances both chemically and biologically. Because the actions of the substances are multiple, a confusingly large number of methods, based on different responses, with correspondingly many units, have been proposed. The space available permits discussion of only a few of the problems, and the same limitation prevents reference to much of the enormous amount of work done.

GENERAL PROBLEMS INVOLVED IN BIOASSAYS

Criteria which determine the suitability of a biologic method of assay are:

1. Objectivity. The weight of an object is the same in one laboratory as in another, and therefore a good balance is more reliable than the most conscientious investigator's judgment.
2. Sensitivity. There should be a large increase in response following a small increase in dose; this obviously makes for greater accuracy.
3. Simplicity. When assays must be done frequently and expense is a consideration, a complicated or expensive procedure, no matter how accurate, will usually fail in practice.

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4. Individual variation. The unfortunate property of test animals to differ greatly in their individual responses to drug or glandular treatment has been emphasized by every one engaged in assay work. The greater this variation, the larger the number of animals which must be employed.

These are the most fundamental factors. However, it is apparent, no matter which method is chosen, that all details of technic must be duplicated each time the assay is performed, in order that results may be reproducible. Such details are: type and age of animals, duration of injection period, route of administration, single or divided dose, menstruum, and purity of substance being assayed.

THE ASSAY OF GONADOTROPINS

Gonadotropins Concerned.—The gonadotropic preparations used clinically originate chiefly from three sources: the urine of pregnant women, the serum of pregnant mares and the anterior lobe of the pituitary. Large amounts of a gonadotropic substance are excreted by castrate and menopausal women, but this source has not been exploited commercially. Normal women throughout the midinterval of the menstrual cycle also excrete a gonadotropic substance similar to that found in castrate women, but the small amount renders this source unimportant. There is considerable agreement that the gonadotropin in the urine of pregnant women is entirely luteinizing, while that in the serum of pregnant mares is largely, if not entirely, follicle stimulating. Separation of anterior pituitary extracts into pure or nearly pure follicle-stimulating and luteinizing fractions has been accomplished, and some of the commercial preparations are nearly entirely follicle stimulating in effect. Hypophysectomized animals are essential in determining that the separation has been made.

Assay Methods.—Since no chemical methods are available, these are based on biologic responses. Suitable reactions are discussed in reference to the established criteria in the following paragraphs:

1. Increase in weight of seminal vesicles. This method is applicable to preparations of the gonadotropin in the urine of pregnant women and of that in pregnant mare's serum. It is completely objective; the sensitivity is moderate; with practice the process is simple, requiring not more than thirty seconds for dissection of the vesicles and a little more for weighing. The structures can be cleanly and completely removed. The individual variation, i. e., difference between the maximum and the minimum response on a given dose, is about 100 per cent.

2. Increase in weight of ovaries. This method is applicable to preparations of gonadotropins from all three sources and is completely objective. The sensitivity varies with the gonadotropin concerned, being low for that of pregnancy urine, low at low doses for that of pregnant mare's serum but higher with larger doses, and moderate for anterior pituitary gonadotropin. It is simple, with practice the ovaries can be cleanly and completely dissected, and the time required is little longer than for seminal vesicles. The individual variation is somewhat greater than with the seminal vesicle method.

3. Increase in weight of uteri. This method is applicable to all three types of gonadotropins; it is completely objective and about as easy as the previous ones. The great absolute weight of the uteri is an advantage, making exact weighing less important. The sensitivity is great, a six-fold increase in weight being

obtained on either pregnancy urine or pregnant mare's serum preparations, with doses which will only double the weight of the seminal vesicles and hardly affect the ovarian weight at all. The individual variation is great, being in some studies 300 to 400 per cent, which makes the use of large numbers of animals necessary. One disadvantage is the fact that the weight curve reaches a maximum and then declines with larger doses.

4. Vaginal cornification. This method is the simplest and is applicable to preparations of gonadotropins from all three. It is reasonably objective, provided one sets as his standard a full estrus smear, i. e., the complete disappearance of leukocytes and their replacement by epithelial cells. The sensitivity is great and appears to parallel rather closely the uterine weight method.

5. Luteinization. This method is unsatisfactory in practically every respect. Unless microscopic sections are prepared, which takes time and labor, the degree of luteinization is difficult to determine; macroscopic examination fails on the score of objectivity. The method is insensitive and individual variation still rather great.

From the foregoing discussion the following conclusions may be drawn: Organ weight methods have the advantage of objectivity; however, the ovarian response is rather insensitive and the seminal vesicle response decidedly insensitive to anterior pituitary preparations. This leaves the uterine weight method as applicable to preparations of gonadotropins from all three sources and as being both objective and sensitive. Individual variation is great, but that is characteristic to some degree of all biologic assays. Vaginal cornification is simplest and reasonably objective with practice. Since both uterine weight and vaginal estrus can be determined simultaneously, i. e., on the same animals, a combination of the two might be employed. However, it must be remembered that both responses are also produced by estrogens, and the absence of the latter from the material being assayed must be assured.

Assay of Commercial Gonadotropins and Establishment of International Standards.—Several studies of commercial preparations have been reported.¹ Usually (less rarely with anterior pituitary preparations) it is found that these materials contain the biologic activity stated on the label to be present, according to the method of assay employed. However, all such studies emphasize the fact that no comparison of activity is possible because of the lack of uniformity of the assay methods employed. This situation has been measurably relieved by the establishment of international standards and the definition of international units for the gonadotropin in the urine of pregnant women² and that in pregnant mare's serum.³ This improvement has resulted from the work of the Commission of Biological Standardization of the Health Organization of the League of Nations and is to be highly commended. For both substances, contributions from a number of laboratories were pooled and diluted to a proper concentration, the

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2. Memorandum on the International Standard for the Gonadotrophic Substance of Human Urine of Pregnancy (Chorionic Gonadotropin) Established by Department of Biological Standards, National Institute of Medical Research, Bull. Health Organ., League of Nations **8**: 884, 1939.

3. Memorandum on the International Standard for the Gonadotrophic Substance of Pregnant Mares' Serum Established by Department of Biological Standards, National Institute for Medical Research, Bull. Health Organ., League of Nations **8**: 898, 1939.

final product representing the International Standard Preparation. In the case of preparations of pregnancy urine gonadotropin, the international unit (I. U.) is defined as "the specific gonadotrophic activity of 0.1 mg. (100 gamma) of the standard preparation"; in the case of preparations of pregnant mare serum gonadotropin the international unit is 0.25 mg. of the standard preparation. In both cases the following recommendation for use of the standard preparation in biologic assays is made:

The only tests for the comparative determination of gonadotrophic activity, in units as above defined, on which the Conference has evidence to justify recommendation, depend on:

- (a) The observation of a direct or indirect gonadotrophic effect, shown by morphological changes in the gonads;
- (b) The observation of secondary changes in the accessory reproductive organs, in animals not deprived of their gonads. When this type of test is used, the absence of substances directly causing such changes in the accessory reproductive organs should be assured by control tests on animals deprived of their gonads.

In more recent publications⁴ the data obtained from the assay of materials making up the pools are submitted to statistical analysis. It is recommended that for preparations of pregnancy urine gonadotropin the vaginal cornification test be employed. No specific recommendation is made for preparations of pregnant mare serum gonadotropin.

The Council on Pharmacy and Chemistry of the American Medical Association has recommended the adoption of international units in expressing the potency of Council-approved preparations. It is desirable to know just how much biologic activity is represented by 1 international unit of either material and also how the activities of the two compare over a range of doses. In one such study⁵ it was found that the biologic activity of 1 international unit of each was approximately the same, but at higher levels of dose the ovarian response was much greater with the gonadotropin of pregnant mare serum than with that of pregnancy urine.

As regards the anterior pituitary gonadotropin, the Commission of Biological Standardization has not felt that complete separation into follicle-stimulating and luteinizing fractions was sufficiently assured to warrant establishing international standards for materials from this source. Confusion will therefore continue to exist in respect to the activity and unitage of anterior pituitary preparations.

While the establishment of international units for preparations of gonadotropins from two of the three sources is no doubt a long step toward uniformity, it must not be supposed that this will solve the problem completely. Such standards have been used in estrogen standardization for several years. However, one still finds in the labels on well known commercial estrogenic preparations mention of "rat units," "active biological units" and "vaginal canalization units." Oral administration has also introduced a confusing factor in that a preparation containing the stated number of international units when assayed subcutaneously produces a much smaller biologic response when administered orally. Percutaneous administration presents a similar difficulty. Consideration must also be given to the pos-

sibility of deterioration on standing, as well as to variability of response with the use of different vehicles, i. e., aqueous vs. oil suspensions. Some of these, and no doubt other problems, may be anticipated in the gonadotropin sphere. Some clinicians do not yet recognize the fact that preparations of the gonadotropins come from three different sources and possess different properties, and the failure to establish international units for the anterior pituitary gonadotropins may, if the gonadotropins from the three sources are confused, reduce the value of the establishment of such units for the other two.

Summary.—Gonadotropins can be assayed only by biologic methods whose accuracy is dependent on careful control of many factors. Of the methods available, that of vaginal cornification appears to be the most highly recommended. International units have been established for the gonadotropin prepared from the urine of pregnant women and for that from pregnant mare's serum but not for the anterior pituitary gonadotropins. Although the establishment of international units has eliminated much confusion, the use of these units is no guaranty of uniformity of results in practice.

THE ASSAY OF GONADAL HORMONES

The development of reliable methods of assay has led to the isolation of estradiol (dihydrotheelin) from the follicle fluid of the sow,⁶ progesterone from the corpus luteum of the sow⁷ and testosterone from the testicle of the bull.⁸ As a result of metabolic changes in the body, these primary principles are altered chemically and eventually are found in the urine as degradation products which in some instances are conjugated with glycuronic acid. These conjugated compounds, which are soluble in water and insoluble in most of the immiscible solvents, have lost much of their biologic activity. Androgenic and estrogenic conjugates occur in the urine of both sexes. The adrenal cortex may compensate for regression of gonadal activity by secreting androgens and estrogens.⁹ These findings have complicated the problem of analysis and the task of interpretation.

Since crystalline estrogens, androgens and progesterone are available, biologic assays are necessary only to confirm the dosages stated on the labels of commercial preparations. So far as we know, clearcut distinctions have not been made in the clinical use of various estrogens and androgens. It is of course recognized that the greater solubility of estriol (theolol) in water affects the rate of absorption. The occurrence of these substances in the blood and urine has led to the hope that a quantitative determination of these products would be useful in furnishing more complete information about normal physiologic mechanism, provide a basis for the diagnosis of pathologic conditions and possibly offer a guide to therapy. It must be admitted that the task is difficult because of its complicated nature. Two general sorts of methods are used for the quantitative assay of these substances in blood and urine—biologic methods and chemical methods. Space does not permit a complete discussion of the details of these methods.

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Urinary Estrogens.—Estrone (theelin) and estriol (theelol) are found in human urine almost entirely conjugated with glycuronic acid. The glycuronides must be hydrolyzed by acidifying the urine and heating before the estrogens can be extracted with immiscible solvents. Long boiling results in destruction of the estrogens. A compromise therefore has to be established between complete hydrolysis and minimum destruction.¹⁰ Marrian¹¹ adjusted the p_H to about 1 and then heated the material in an autoclave at 120 C. for two hours.

Two biologic methods are used to assay these extracts for their total estrogenic content: the growth of the uterus of the immature rat or mouse; the growth of the uterus of the castrate rat or mouse. Bülbring and Burn¹² found that the increase in the weight of the uterus varies as the logarithm of the dose. Astwood¹³ has proposed a six hour assay, which depends on the rapid imbibition of water by the uterus of the immature rat during the first six hours the animal is under the influence of an estrogen. The vaginal smear method of Allen and Doisy is more generally used. The accuracy of this method of assay has been studied carefully.¹⁴ By direct application of the preparation to the vagina, Lyons¹⁵ was able to detect $\frac{1}{200}$ of a rat unit of estrone. Subcutaneous injections of divided doses of an aqueous solution or suspension have been used by most workers, although maximum absorption appears to be obtained by the intraperitoneal route. Unfortunately, the increase in sensitivity toward estrone and estriol with increase in the number of injections is not the same in the mouse. Emmens^{14b} found that 7 micrograms of estriol gave a 50 per cent response when the substance was given in two injections, but that only 0.16 microgram was required when four injections were given during the same period. With estrone, 0.1 microgram gave a 50 per cent response with two injections, and 0.067 microgram gave the same response with four injections. It is therefore of the utmost importance to repeat various methods of assay for total estrogenic content in exactly the manner reported by the original author if the results are to be comparable. The observations also show that the separation of the different estrogens before assaying the extract would give much more fundamental data.

Substances which do not possess estrogenic activity will sometimes accentuate the activity of the estrogens, and therefore a crude preparation may exhibit greater activity than the pure estrogen.

Attempts to follow the day by day total excretion of estrogens have been made by a number of workers.¹⁶ Two peaks of excretion occur, one at the midinterval, presumably related to ovulation, and the second following the activity of the corpus luteum.

The separation and purification of the various estrogens depend on dividing the extract into (a) acidic substances, which are extracted from an ether solution with sodium carbonate, (b) stronger phenolic substances, which are extracted from the ether solution with tenth-normal sodium hydroxide, and (c) weaker phenolic substances, which are extracted from the ether solution with normal sodium hydroxide.

Colorimetric Assays.—In view of the time, expense and inherent difficulties in biologic assays, colorimetric reactions are being studied. Absorption spectra may be used for the qualitative detection of the estrogenic and androgenic substances and are useful as a supplementary aid in the quantitative estimation of these substances. Callow and co-workers¹⁷ indicated the value of spectrum analysis in pointing out that colorimetric estimation can replace the biologic assay provided due regard is given to the occasional presence of interfering compounds, which may be revealed when the absorption spectrum is examined. These workers studied and determined the absorption spectrums of seventeen androgenic and estrogenic substances or immediately related compounds.

A second method is the development of color through specific reactions and the comparison of this color with a standard, using the photoelectric colorimeter with carefully chosen filters.

Voss¹⁸ studied the color reactions of estrogens with 1-nitroso-2-naphthol. The color obtained depends on the estrogen used. Schmulovitz and Wylie¹⁹ used the orange color developed when the estrogens are coupled with diazotized p-nitroaniline. David²⁰ noted a typical blue color when estriol crystals were treated with sulfuric acid followed by arsenic acid. The reaction lacks sensitivity and cannot be used with impure extracts, since, according to Pincus and collaborators,²¹ a bluish cloudy suspension always occurs.

Perhaps the earliest work on colorimetric determination of the sex hormones was that by Kober,²² in which

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he used equal parts of concentrated sulfuric acid and phenolsulfonic acid in reaction with estrone. Cohen and Marrian²³ found it necessary to modify this method. The variation in tint of the final color makes it necessary to use a Lovibond tintometer to analyze and determine separately the intensities of the components. The authors expressed the belief that the estrone and estriol present in human pregnancy urine may be separated and estimated with a reasonable degree of accuracy by their modification of the Kober reaction. The separation of the estrone and estriol is not quantitative but is sufficiently complete to permit detection of any abnormal amounts of either compound in pregnancy urine. With "synthetic urines" of known estrone and estriol content, they observed a 13 per cent loss of estriol but a nearly quantitative recovery of estrone. Their work showed the necessity of removing pregnandiol and cholesterol.

Pincus and co-workers²¹ used the phenosulfonic acid colorimetric method and obtained reliable results with the estrone and estriol fractions of human pregnancy urine. Their results check particularly well with those of biologic assays on urines from women in the sixth to ninth months of pregnancy, though the estrone fraction even in late pregnancy may give "over estimates." Venning and co-workers²⁴ modified the method of Cohen and Marrian and attained an accuracy of \pm 5 per cent when 5,000 micrograms of estrogens was present per liter of urine. They obtained poor results from early pregnancy and nonpregnancy urines, in which the estrogens are present in relatively small amounts. They used a photoelectric colorimeter in making their measurements.

Bachman^{25a} used a diluted sulfonic acid reagent and carried out the reaction at 150 C. He found that the use of the modified reaction made feasible an examination of the chromogenic properties of estrogen, α -estradiol, and estriol and established conditions under which the total content of a mixture of these three may be determined.

Bachman^{25b} developed a new reaction for estriol. This estrogen is heated at 150 C. with sodium phenolsulfonate in phosphoric acid. A stable violet pink color is obtained.

Hormones from the Corpus Luteum.—Progesterone, the secretion of the corpus luteum, is reduced from a diketone to a dihydroxy compound called pregnandiol, which occurs in normal and pregnancy urine conjugated with glucuronic acid. It is difficult to prove the presence of progesterone in blood or urine. Venning has shown that it is possible to determine the quantity of pregnandiol with a fair degree of accuracy.²⁶ Pregnandiol occurs in increasing quantities in the urine following ovulation and disappears just previous to menstruation.²⁷ During the first two months of pregnancy the excretion remains on the level of the luteal phase of the cycle, then rises until a maximum is attained, in the eighth month, and falls abruptly before parturition.²⁸

Urinary Androgens.—The practical biologic methods of assaying androgens are limited to the growth of the comb in the capon and the increase in the weight of the seminal vesicle in the rat or the mouse. Since the androgens occur in conjugated forms, it is necessary to hydrolyze the urine before extracting with immiscible solvents. Here the period of boiling must be limited to fifteen minutes if losses by destruction are to be avoided.²⁹ The problem of assaying the crude extract from urine is fraught with many problems.³⁰

The growth of the comb of the capon has been used for assaying androgens. The test may be made more sensitive if the material is applied directly to the comb, provided the estrogens are first removed, since they have an inhibiting effect on comb growth. Frank and Klempner,³¹ Voss³² and others have used the increase in weight of combs of baby chicks. The lack of a baseline from which to measure is an objection to these methods.

The response of the seminal vesicle is so complicated that it is practically valueless as the basis of an assay method. Foreign substances, not in themselves androgenic, augment the effect of androgens present, as shown by many workers.^{30a} These so-called x substances do not affect comb growth.

In the early work on the testicular hormone it was assumed that the androgenic material which could be extracted from normal urine was "the male hormone" and that the biologic assay of urinary extracts would give an index to the level of testicular secretion. However, androgenic activity is not specific to one substance, and at least two related compounds with androgenic activity, androsterone and transdehydroandrosterone, are present in the mixture of neutral compounds which can be prepared from urine. Further, these two compounds occur in the urine of both sexes. This distinction between hormones and excretory transformation products is confirmed by the discovery that testosterone is degraded in the human body to give androsterone and the stereoisomeric, inactive compound aetiocholan-3(a)-ol-17-one.³³ Androgenic substances in the urine may be derived from the adrenal cortex, since quantities of androgens and related steroids have been isolated from the urine in cases of adrenal disease.³⁴ For these extracts, which consist of a complex mixture of degradation products, may not be an index of the production of androgens. Zimmermann³⁵ investigated the colors produced when urinary extracts are treated with m-dinitrobenzene. This method is based on the nonspecific reaction between the $\text{CH}_2\text{C}=\text{O}$ group and m-dinitrobenzene in alkaline solution. The temperature, duration of reaction, alkalinity of the solution, relative amount of reactants and intensity of light to which the solution is exposed must be carefully controlled.³⁶ This reaction

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is given by a number of compounds of the 17-ketosteroid type. The color given in this reaction bears no relation to the biologic activity of the compound. It may be possible that the measure of these ketosteroids, the biologically active and the inactive, may be of more significance than an assay of biologically active urinary androgens. Wu and Chou³⁷ applied the reaction to a large series of urines. Callow and co-workers¹⁷ showed close spectrographic similarity of the colors given by neutral fractions of urinary extracts and by pure compounds. Comb growth-promoting activity of urinary extracts, expressed in terms of the international standard, is only roughly proportional to the content of 17-ketosteroid compounds.

Androgens and Estrogens in Blood.—Androgens occur in the blood in such minute quantities that quantitative assays at the moment seem impossible. Attempts to assay the estrogen content of blood have been the subject of a number of papers. While some progress has been made, the limited quantity of blood which may be drawn for analysis and the small quantity of estrogen to be assayed make this problem even more difficult than the analysis of urine.

Summary.—It is obvious from the foregoing considerations that a great deal of research must be carried on before a satisfactory solution will be obtained to the problem of the analysis of urine and blood for sex hormones.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
THEODORE G. KLUMPF, M.D., Secretary.

PRESENT STATUS OF ACETYL-BETA-METHYLCHOLINE CHLORIDE, MECHOLYL CHLORIDE-MERCK

(Formerly Mecholin-Merck)

A preliminary report of the Council on Pharmacy and Chemistry on acetyl-beta-methylcholine (Mecholyl-Merck) was published in 1935.¹ At that time the Council deferred consideration of the name Mecholin, under which the chloride salt of the base was originally submitted by Merck & Company. Subsequently this firm submitted the name "Mecholyl" to replace the previous proprietary name, and on the basis that the firm had rendered a service in making a pure preparation of this compound available and in facilitating the investigation of its applications the Council voted to accept the new proprietary name.

Since the publication of the preliminary report by the Council, many workers have investigated the value of acetyl-beta-methylcholine chloride in various conditions, and much additional information on the clinical use of the drug has become available. Starr² has extended his studies on the effect of acetyl-beta-methylcholine chloride in the cardiac arrhythmias. In a series of 25 attacks of paroxysmal tachycardia in 37 patients he observed that in 66 instances (88 per cent) the attack was brought promptly to an end when the drug was given. In one series of 50 attacks in 17 patients, Starr observed a stoppage

of the attack in 58 per cent of the instances when a single dose of the drug alone was given. In 20 per cent of the attacks a second and usually a larger dose of the drug was required. Kovacs, Saylor and Wright³ likewise observed a favorable effect of acetyl-beta-methylcholine chloride in this condition. In auricular flutter the clinical effects were uncertain² and in auricular fibrillation Starr found the drug to be without therapeutic value. For preventing attacks of paroxysmal tachycardia the drug was found to be inferior to quinidine.

The amount of acetyl-beta-methylcholine chloride required to terminate attacks of paroxysmal tachycardia varies with the age as well as with the weight of the patient. Starr² found that larger doses were usually required to stop an attack in older persons than in young ones. In patients under 52 years of age the subcutaneous administration of 30 mg. of the drug was usually sufficient, but in older patients this amount failed more often than it succeeded in restoring normal rhythm. In a patient aged 18 an attack was stopped by 10 mg., and the side effects were as intense as those which followed the injection of 50 mg. regularly required to stop attacks in a man aged 60. Page⁴ likewise observed that young persons react to the drug more vigorously than do older ones.

Starr⁵ has investigated the influence of other drugs on the action of acetyl-beta-methylcholine chloride. Digitalis in some instances appeared to increase the effect of acetyl-beta-methylcholine chloride on the heart, but experiments on animals gave no clearcut evidence of this effect.

Pines⁶ found that the cardiac action of acetylcholine was increased by strophanthin in some animal experiments. An antagonism between the cardiac action of acetyl-beta-methylcholine chloride and of quinidine was observed by Starr.⁷ He found also that acetyl-beta-methylcholine chloride failed to stop an attack of paroxysmal tachycardia in patients who were receiving quinidine.⁵

The various side actions of acetyl-beta-methylcholine chloride and the precautions to be observed in using this drug were discussed in the previous report by the Council.¹ Among the side effects are flushing of the face and neck, generalized sweating, salivation, a sense of pressure under the sternum, abdominal discomfort, slight fall in blood pressure and an increase in the pulse rate. In normal subjects these effects were usually observed within a minute after the injection of 20 mg. of the drug. The effect on the blood pressure and the increase in the pulse rate pass off in a few minutes and are usually followed by a pulse rate that is slower than before the injection. The other effects last for several minutes. Starr² advises that the patient be kept in the horizontal position during the time of action of the drug, as a fall in blood pressure is likely to cause fainting if the subject is in the upright position.

Several authors have cautioned against the use of acetyl-beta-methylcholine chloride in patients subject to asthma (Starr,² Kotkis⁸). In such subjects asthmatic attacks promptly follow injection of the drug. The use of acetyl-beta-methylcholine chloride in asthmatic subjects is therefore contraindicated.

It appears that in hyperthyroidism also considerable caution must be employed. Nahum and Hoff⁹ found that acetyl-beta-methylcholine chloride converted the normal cardiac mechanism into auricular fibrillation in four patients with hyperthyroidism, whereas in normal subjects auricular fibrillation was never observed following the use of the drug.

3. Kovacs, Joseph; Saylor, L. L., and Wright, I. S.: The Pharmacological and Therapeutic Effects of Certain Choline Compounds; Results in the Treatment of Hypertension, Arthritis, Organic Occlusive Vascular Disease, Raynaud's Disease, Scleroderma and Varicose Ulcers, *Am. Heart J.* 11: 53 (Jan.) 1936.

4. Page, I. H.: A Syndrome Simulating Diencephalic Stimulation Occurring in Patients with Essential Hypertension, *Am. J. M. Sc.* 190: 9 (July) 1935; Acetyl-Beta-Methylcholine (Mecholin): Observations Concerning Its Action on the Blood Pressure, Skin Temperature and the Heart as Exhibited by the Electrocardiogram of Hypertensive Patients, *ibid.* 189: 55 (Jan.) 1935.

5. Starr, Isaac, Jr., footnotes 2 and 7.

6. Pines, I.: L'action de l'acetylcholine et du vague sur le coeur après administration de quelques poisons agissant sur le vague cardiaque, *Arch. internat. de pharmacodyn. et de therap.* 49: 91 (Oct. 31) 1934.

7. Starr, Isaac, Jr.: A Note on the Antagonism Between the Cardiac Action of Acetyl-Beta-Methylcholine and Acetyl Choline and That of Quinidine, *J. Pharmacol. & Exper. Therap.* 56: 77 (Jan.) 1936; Acetyl-Beta-Methylcholine: III.¹⁰

8. Alexander and Kotkis.¹¹ Kotkis and Melchionna.¹⁴

9. Nahum, I. H., and Hoff, H. E.: Auricular Fibrillation in Hyperthyroid Patients Produced by Acetyl-Beta-Methylcholine Chloride with Observations on the Role of the Vagus and Some Exciting Agents in the Genesis of Auricular Fibrillation, *J. A. M. A.* 105: 254 (July 27) 1935.

37. Wu, H., and Chou, C. Y.: Colorimetric Methods for Determination of Sex Hormones in Human Urine, *Chinese J. Physiol.* 11: 413 (May 15) 1937.

1. Acetyl-Beta-Methylcholine and Mecholyl (Mecholin)-Merck. Report of the Council on Pharmacy and Chemistry, *J. A. M. A.* 105: 281 (July 27) 1935.

2. Starr, Isaac, Jr.: Acetyl-Beta-Methylcholine: IV. Further Studies of Its Action in Paroxysmal Tachycardia and in Certain Other Disturbances of Cardiac Rhythm, *Am. J. M. Sc.* 191: 210 (Feb.) 1936; On the Treatment of Paroxysmal Tachycardia and Certain Other Disturbances of Cardiac Rhythm by Acetyl-Beta-Methylcholine, *Tr. A. Am. Physicians* 50: 289, 1935.

It was pointed out in the previous report by the Council that the intravenous administration of acetyl-beta-methylcholine chloride is dangerous. Starr² reports one instance in which 30 mg. of the drug was given intravenously in error. Among the marked effects was a complete stoppage of the heart for seventy seconds. In another instance there was a prolonged cardiac arrest when the drug was given intravenously. As indicated previously,¹ many of the undesirable effects of acetyl-beta-methylcholine chloride can be abolished or prevented by the injection of atropine. On the other hand, the effects can be intensified or prolonged by massaging the site of injection. Starr¹⁰ has recommended that, in cases in which an injection has failed to arrest an attack of paroxysmal auricular tachycardia, the site of injection may be gently massaged and then, after a wait of twenty minutes to ascertain the effect of delayed absorption, a second injection may be given. This procedure not only may aid in the total utilization of the first dose but also may tend to prevent the possibility of cumulative effects of a subsequent injection.

Starr² observed no evidence to suggest that harm may result from the prolonged use of acetyl-beta-methylcholine chloride; on the other hand, Heinlein¹¹ was able to produce definite anatomic changes in the blood vessels of rabbits given repeated doses of acetylcholine for long periods of time. The vessels of the heart and lungs especially were involved. The amounts of acetylcholine used in these experiments were much greater than are likely to be given when the drug is used clinically; yet the findings suggest that the prolonged administration of large amounts of the drug might not be without some danger.

The effects of acetyl-beta-methylcholine chloride administered by ion transfer (iontophoresis) have been studied by many workers. Rutenbeck¹² found that several choline derivatives, including acetyl-beta-methylcholine chloride, may be introduced into the human body by this method. Alexander and Kotkis¹³ showed that the perfusate of the limb of an experimental animal treated by ion transfer (iontophoresis) of the drug contained a substance having the physiologic properties of acetyl-beta-methylcholine chloride.

On administering the drug by ion transfer (iontophoresis) Kotkis and Melchionna¹⁴ were able to produce the same general effects as by subcutaneous injection. Kovacs, Saylor and Wright³ have confirmed these observations. Abel¹⁵ found that acetyl-beta-methylcholine chloride given by ion transfer (iontophoresis) increases the capillary flow as evidenced by increased redness of the area treated. He used the drug in 51 cases of osteoarthritis, rheumatoid arthritis, myositis and neuritis and observed relief from symptoms in most instances.¹⁶ Boyd, Osborne and Markson¹⁷ similarly observed beneficial effects of the drugs in patients with chronic arthritis. Kovacs¹⁸ obtained encouraging results in 90 per cent of the patients with rheumatoid arthritis whom he treated. He attributed this effect of the drug to the increase in the peripheral blood supply. The results in patients with osteoarthritis were less satisfactory. Mathae¹⁹ administered acetyl-beta-methylcholine chloride to 73 patients with arthritis. In the patients with the atrophic type of arthritis, symptoms were relieved in 73 per cent; in the hypertrophic form of the disease satisfactory results were

observed in 57 per cent of the cases. Everhardt²⁰ also believes that acetyl-beta-methylcholine chloride is of considerable value in decreasing the pain and swelling of the affected joints in patients with arthritis. On the other hand, Nagelschmidt²¹ and Kling²² found histamine phosphate given locally more effective than acetyl-beta-methylcholine chloride in the treatment of arthritis.

Present evidence indicates that acetyl-beta-methylcholine chloride when given by ion transfer (iontophoresis) exerts a systemic as well as a local effect. It does not indicate accurately the degree of absorption or the effect which can be expected from the local application.

Kovacs, Saylor and Wright⁴ have used acetyl-beta-methylcholine chloride by ion transfer (iontophoresis) in the treatment of various ulcers. In 9 patients, rapid and complete healing of the ulcers followed treatment. In 12 patients with Raynaud's disease, these authors observed increased warmth and improved color of the hands and feet affected, following the use of the drug by local ion transfer (iontophoresis). Starr had previously found that acetyl-beta-methylcholine given by mouth did not prevent or alleviate the spasm when the extremity was exposed to severe cold. The drug appeared, however, to have some beneficial effect in spasm following moderate exposure. Goldsmith²³ gave large doses of acetyl-beta-methylcholine chloride by mouth and noted that an average maximal rise in temperature of the digits of over 5 degrees C. The vasodilator effect of the drug varied tremendously with different patients and in different pathologic conditions. In peripheral vascular disease with organic changes (arteriosclerosis, thromboangiitis obliterans and emboli) Kovacs, Saylor and Wright were unable to observe any therapeutic effect. Starr also failed to note any definite improvement in symptoms when acetyl-beta-methylcholine chloride was given in 4 cases of the occlusive type of peripheral vascular disease. Acetyl-beta-methylcholine chloride has been used for its parasympathetic effects in several other conditions. Most of the literature covering these observations was reviewed in the previous report of the Council. It was indicated at that time that the cases studied were too few in number and that adequate controls were lacking in most of the reports. The reported observations of Gernon, Ewert and Herrold²⁴ and of Palmer and McKenna²⁵ on the use of acetyl-beta-methylcholine chloride in patients with urinary bladder dysfunction secondary to tabes and multiple sclerosis should be confirmed in a larger series of cases. Horn²⁶ and Langworthy²⁷ also consider the drug to be beneficial for such patients, but further observations should be made to establish the value of acetyl-beta-methylcholine chloride in these conditions.

SUMMARY

The data available at this time suggest that acetyl-beta-methylcholine chloride is of value in certain instances of paroxysmal tachycardia. For selected patients in whom an attack of paroxysmal tachycardia cannot be terminated by other methods, such as carotid sinus pressure, the use of the drug would appear to be indicated. It should be realized that acetyl-beta-methylcholine chloride is capable of causing prompt and severe reactions. Therefore the smaller doses should be tried first, and the drug must never be given intravenously. Massage of the site of the injection should be used with great caution, if at all, as this procedure can increase or prolong the action of the drug. It has been recommended that gentle massage of the site of an initial subcutaneous injection which has failed to

10. Starr, Isaac, Jr.: Acetyl-Beta-Methylcholine: III. Its Action on Paroxysmal Tachycardia and Peripheral Vascular Disease with a Discussion of Its Action in Other Conditions, *Am. J. M. Sc.* 186:330 (Sept.) 1933.
11. Heinlein, H.: Organveränderungen durch körpereigene kreislauf-wirksame Substanzen, *Verhandl. d. deutsch. path. gesellsch.* 29:93, 1936.
12. Rutenbeck, H.: Studien über die Elektrophorese mit Cholinderivaten, *Klin. Wochenschr.* 15:437 (March 28) 1936.
13. Alexander, W. F., and Kotkis, A. J.: The Properties of the Physiologically Active Substance in the Body Resulting from the Administration of Acetyl-Beta-Methylcholine Chloride by Iontophoresis, *J. Pharmacol. & Exper. Therap.* 58:439 (Dec.) 1936.
14. Kotkis, A. J., and Melchionna, R. II.: Physiologic Effects of Acetyl-Beta-Methylcholine Chloride by Iontophoresis, *Arch. Phys. Therapy* 16:528 (Sept.) 1935.
15. Abel, Oliver, Jr.: The Use of Mecholyl in Arthritis, *J. Missouri M. A.* 22:351 (Sept.) 1935.
16. Abel, Oliver, Jr., in discussion on Mathae,¹⁹ The Use of Mecholyl in Arthritis.
17. Boyd, Douglas; Osborne, S. L., and Markson, D. E.: Observations on the Use of Acetyl-Beta-Methylcholine in Chronic Arthritis, *Ann. Int. Med.* 10:728 (Dec.) 1936.
18. Kovacs, Richard: Newer Developments in Physical Therapy of Chronic Arthritis, *M. Rec.* 142:323 (Oct. 2) 1935.
19. Mathae, G. II.: The Treatment of Arthritis with Mecholyl Iontophoresis, *J. Missouri M. A.* 33:303 (Aug.) 1936.

20. Everhardt, F. II., in discussion on Mathae,¹⁹
21. Nagelschmidt, Franz, in discussion on Kotkis and Melchionna.¹⁴
22. Kling, D. II., in discussion on Kotkis and Melchionna.¹⁴
23. Goldsmith, G. A.: The Effectiveness of Acetyl-Beta-Methylcholine Given by Mouth as a Vasodilating Agent, *Ann. Int. Med.* 9:1196 (March) 1936.
24. Gernon, J. T.; Ewert, E. E., and Herrold, R. D.: The Use of Acetyl-Methylcholine in the Treatment of Neurogenic Bladder and Allied Conditions, *M. Rec.* 141:141 (Feb. 6) 1935.
25. Gernon, J. T.; Palmer, E., and McKenna, C. M.: Some Recent Developments in the Treatment of Neurogenic Dysfunction of the Bladder: Based on Cystometry, *J. Urol.* 35:515 (May) 1936.
26. Horn, K. W.: Mecholin (Acetyl-Beta-Methylcholine) as an Adjunct to the Treatment of Certain Types of Atonic Urinary Bladder, *Urosp. Bull., Ann Arbor* 1:3 (March) 1935.
27. Langworthy, O. R.: A New Approach to the Diagnosis and Treatment of Disorders of Micturition in Diseases of the Nervous System, *Internat. Clin.* 3:98 (Sept.) 1936.

arrest an attack of paroxysmal auricular tachycardia may be done to aid in the total utilization of the first dose and in the prevention of the possible cumulative effect of a subsequent injection, and that, after a wait of twenty minutes, a second injection may be given. For patients subject to asthma or for very ill patients in whom the severe side reactions may be dangerous, the use of acetyl-beta-methylcholine chloride is contraindicated.

In the treatment of chronic rheumatoid arthritis the administration of mecholyl chloride by ion transfer (iontophoresis) has been shown to exert a palliative effect in many cases. The application of this method for administration of the drug in some cases of chronic ulcers, Raynaud's disease and other vasospastic conditions of the extremities was also considered carefully by the Council. The Council later voted to reject this method of application of mecholyl chloride because of possible dangers involved in the method of ion transfer (iontophoresis). After further discussion and consideration of a series of opinions on the subject, however, the evidence for the application of such a method seemed to warrant the recommendation that the matter be studied further by the Council on Physical Therapy. The report by that council was adopted by the Council on Pharmacy and Chemistry, which then voted that Mecholyl Chloride (Merck & Company, Inc.) be accepted for inclusion in N. N. R., provided the firm's claims are limited to its use only in the treatment of certain instances of paroxysmal tachycardia by subcutaneous administration, in the palliative treatment of chronic rheumatoid arthritis by the method of ion transfer (iontophoresis) only, and in the treatment of chronic ulcers, Raynaud's disease, scleroderma and other vasospastic conditions of the extremities, preferably by the method of ion transfer (iontophoresis) but also by oral or subcutaneous administration when the former cannot be employed; and provided the firm includes in its advertising material and labels a caution statement that the method of ion transfer (iontophoresis) be employed only by those especially trained, and other warnings applicable to the different modes of administration as indicated farther on.

The Council found that sufficient published clinical evidence to support the claims for the use of mecholyl chloride in bladder dysfunction, abdominal distention, atonic constipation, pelvic inflammation, functional dysmenorrhea, atrophic rhinitis and glaucoma was not available at the present time. It was therefore indicated that these claims for mecholyl chloride could not be permitted and that the equivalent of the following list of warnings, as included in the conditions to its acceptance as already noted, be required to appear in all the firm's advertising of this product: (a) Never administer intravenously because of the danger of cardiac arrest. (b) Consider asthma, hyperthyroidism and any severe illness as contraindications. (c) Avoid massage at the site of injection, except when this may be necessary to determine when a further injection is needed, and then only gently, with due caution. (d) Advise recumbence during subcutaneous administration to avoid possible fainting. (e) By the method of ion transfer (iontophoresis) mecholyl chloride should be administered only by those who have been specially trained and should not under any circumstances be applied directly over ulcers or open wounds and only with care over scar tissue. Extreme care is necessary to prevent burns by galvanism. (f) Prolonged therapy with mecholyl chloride by any route is inadvisable and is contraindicated when grave side reactions occur.

It was further stipulated that the equivalent of the nine "Safety Rules in Galvanism" of Kovacs²⁸ be included in all advertising concerned with the technic of ion transfer (iontophoresis).

The foregoing report (now slightly revised) was transmitted to the firm and it has agreed to restrict its advertising claims for the drug to the uses recognized by the Council and has taken steps to meet the conditions required to make its product acceptable for N. N. R. In the meantime, pending fulfillment of these conditions, the Council voted to publish this further report on the status of the preparation.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

THEODORE G. KLUMPF, M. D., Secretary.

IMMUNE GLOBULIN (HUMAN) (See New and Nonofficial Remedies, 1940, p. 437).

Parke, Davis & Co., Detroit.

Immune Globulin (Human).—A sterile, concentrated and refined human globulin obtained from human placental blood and tissue of healthy mothers whose blood and that from the cord gives a negative Wassermann reaction. The plascentas are shredded and all extracted with saline containing sodium ethyl-mercuri-thiosalicylate. The globulin is fractionally salted out and dialyzed so as to obtain the immune factor or factors against measles, relatively free from extraneous material. Each lot is standardized on the basis of milligrams of nitrogen per cubic centimeter. The diphtheria antitoxin content of each lot is determined. Sodium ethyl-mercuri-thiosalicylate 0.01 per cent is used as a preservative. Tested for sterility according to methods outlined by the National Institute of Health. Marketed in packages of 2 cc. and 10 cc. rubber-capped vials.

THIAMINE HYDROCHLORIDE (See New and Non-official Remedies, 1940, p. 528, under Thiamin Chloride).

The following dosage forms have been accepted:

Pulvoids Thiamine Hydrochloride, 1 mg.: Each pulvoid contains 1 mg. of thiamine hydrochloride equivalent to 333 U. S. P. units.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

Hyposols Solution of Thiamine Hydrochloride Crystals, 6.66 mg. per cc., 1 cc. ampuls: Each cubic centimeter contains 6.66 mg. of thiamine hydrochloride, equivalent to 2,220 U. S. P. units, in sterile distilled water.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

Hyposols Solution of Thiamine Hydrochloride Crystals, 6.66 mg. per cc., 10 cc. vials: Each cubic centimeter contains 6.66 mg. of thiamine hydrochloride, equivalent to 2,220 U. S. P. units, and 5 mg. of chlorobutanol in sterile distilled water.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

Hyposols Solution of Thiamine Hydrochloride Crystals, 6.66 mg. per cc., 30 cc. vials: Each cubic centimeter contains 6.66 mg. of thiamine hydrochloride, equivalent to 2,220 U. S. P. units, and 5 mg. of chlorobutanol in sterile distilled water.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

Hyposols Solution of Thiamine Hydrochloride Crystals, 10 mg. per cc., 1 cc. ampuls: Each cubic centimeter contains 10 mg. of thiamine hydrochloride, equivalent to 3,333 U. S. P. units, in sterile distilled water.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

Hyposols Solution of Thiamine Hydrochloride Crystals, 10 mg. per cc., 10 cc. vials: Each cubic centimeter contains 10 mg. of thiamine hydrochloride, equivalent to 3,333 U. S. P. units, and 5 mg. of chlorobutanol in sterile distilled water.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

Hyposols Solution of Thiamine Hydrochloride Crystals, 10 mg. per cc., 30 cc. vials: Each cubic centimeter contains 10 mg. of thiamine hydrochloride, equivalent to 3,333 U. S. P. units, and 5 mg. of chlorobutanol in sterile distilled water.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

Hyposols Solution of Thiamine Hydrochloride Crystals, 33.33 mg. per cc., 1 cc. ampuls: Each cubic centimeter contains 33.33 mg. of thiamine hydrochloride, equivalent to 11,100 U. S. P. units, in sterile distilled water.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

Hyposols Solution of Thiamine Hydrochloride Crystals, 33.33 mg. per cc., 10 cc. vials: Each cubic centimeter contains 33.33 mg. of thiamine hydrochloride, equivalent to 11,100 U. S. P. units, and 5 mg. of chlorobutanol in sterile distilled water.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

Hyposols Solution of Thiamine Hydrochloride Crystals, 33.33 mg. per cc., 30 cc. vials: Each cubic centimeter contains 33.33 mg. of thiamine hydrochloride, equivalent to 11,100 U. S. P. units, and 5 mg. of chlorobutanol in sterile distilled water.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

Hyposols Solution of Thiamine Hydrochloride Crystals, 50 mg. per cc., 1 cc. ampuls: Each cubic centimeter contains 50 mg. of thiamine hydrochloride, equivalent to 16,667 U. S. P. units, in sterile distilled water.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

Hyposols Solution of Thiamine Hydrochloride Crystals, 50 mg. per cc., 10 cc. vials: Each cubic centimeter contains 50 mg. of thiamine hydrochloride, equivalent to 16,667 U. S. P. units, and 5 mg. of chlorobutanol in sterile distilled water.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

Hyposols Solution of Thiamine Hydrochloride Crystals, 50 mg. per cc., 30 cc. vials: Each cubic centimeter contains 50 mg. of thiamine hydrochloride, equivalent to 16,667 U. S. P. units, and 5 mg. of chlorobutanol in sterile distilled water.
Prepared by The Drug Products Co., Inc., Long Island City, New York.

²⁸ Principles and Practice of Physical Therapy, vol. 3, chapter 9, pp. 10-11.

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SATURDAY, JULY 19, 1941

THE NATIONAL SCIENCE FUND

The National Science Fund, recently created under the auspices of the National Academy of Sciences, is a new and unique type of foundation for research that deserves the attention of the medical profession. The National Science Fund begins by creating machinery to receive and administer gifts for the advancement of science. Through its new procedure the great facilities of the National Academy of Sciences and its agency, the National Research Council, are placed at the disposal of those who wish to give to science. A center is thus provided to which any one may go to obtain competent impartial guidance in making an investment in science. The joint board of directors of the fund is made up of scientists selected from the membership of the academy and distinguished laymen. The new organization is prepared either to receive and administer large or small gifts or to act as an advisory group in a consultant capacity to any person or organization interested in making effective contributions to the support of science. The fund does not plan to carry on research of its own but will work through existing agencies.

Because it is affiliated with the National Academy of Sciences, the National Science Fund has the opportunity of playing a most important part in the scientific development of this country. In addition to its important task of contributing to the general support of the natural and biologic sciences, it has the facilities for locating and defining backward fields or problems in science which should receive support but which have hitherto been neglected. Efforts of the National Science Fund to assure continued and increasing support for fundamental science should be welcomed by the medical profession.

The organization of the National Science Fund resulted from a three year study of the present sources of financial support for fundamental research in science. Under the chairmanship of Dr. Albert F. Blakeslee, former president of the American Association for the Advancement of Science, a committee of academy members with the aid of a grant from the Carnegie Corpora-

tion of New York completed a survey of existing foundations and research funds. The survey showed the urgent need for additional funds for the support of science and suggested the advisability of establishing a permanent mechanism which would guarantee, as far as humanly possible, wise application of such funds as might be received. Basing its conclusions on this survey, the committee recommended to the National Academy of Sciences that the National Science Fund be created to assist in continued support of research in science and to provide unknown donors, at unknown times and in unknown places, a means through which they might make investments in science of enduring usefulness.

Members of the medical profession are often asked to advise prospective donors who wish to make effective and enduring contributions to medical science. The National Science Fund offers an advisory center to which any donor can be referred for authoritative assistance in making a wise and satisfying investment in the advancement of science.

THE ELECTRON MICROSCOPE

The progress of bacteriology was favored by the providential fact that pathogenic bacteria are within the limits of visibility of the present day microscope. For some time, however, it has been known that the sizes of micro-organisms extend far beyond the limits of visibility of light microscopes. Now comes the electron microscope, which extends the observation range by a factor of about fifty to one hundred. Electron microscopy, according to Marton,¹ of the R. C. A. Research Laboratories, is based on the discovery of geometrical optics for electrons similar to the optics of light. An electric or magnetic field of rotational symmetry acts on an electron beam as a lens; that is, the electron beam is concentrated or made divergent in the same way in which the light beam is acted on by the glass lens. It has been proved mathematically that the laws of geometrical optics can be fully applied to such systems and experimentally that electronic images may be obtained which can be made visible on a fluorescent screen. An image can be formed of any self-emitting object, as would be the case with light if we observed the image of the source itself, or we can illuminate an object in the same way as we illuminate one in a light microscope and observe the image of the object with the help of the illuminating beam. The next step, according to Marton, was the building of compound optical systems corresponding to the compound microscope. The light source of the light microscope is replaced by an electron source, the electron beam being concentrated on the specimen by means of the first field in the same way in which the light beam is concentrated by means of a condenser lens. Since the electrons travel only

1. Marton, J.: The Electron Microscope: A New Tool for Bacteriological Research, *J. Bacteriol.* 41: 397 (March) 1941.

in a vacuum, the microscope must be pumped out to a high degree. The great advantage of an electron optical system lies in its highly increased resolving power. The mechanism of image formation is different from that in the light microscope. In the latter we see the image due to differences in absorption or refraction in the specimen. In the electron microscope the image formation is due to scattering of the electrons. The usual technic of preparing bacteriologic specimens for electron microscopy is to suspend them in distilled water and to allow a small drop of this suspension to dry on the film surface. The object is placed on a nitrocellulose film less than a millionth of an inch in thickness, which is stretched over a small disk of fine wire cloth. Staining has not yet been applied in electron microscopy. The final image has a magnification up to twenty-five thousand. Added detail may be brought out on the plates thus obtained by photographic enlargement, bringing the total magnification up to a hundred thousand.

Stanley and Anderson² studied purified preparations of five viruses by means of the electron microscope. The electron micrographs of the ultracentrifugally isolated tobacco mosaic virus showed a predominating unit of 15 millimicrons in width and 280 millimicrons in length, representing presumably single particles of this virus, together with aggregates formed by the end to end and side to side aggregation of this unit and a small amount of rods having shorter lengths.

Taking advantage of the fact that the electron microscope is capable of recording the sizes, shapes and reactions of protein molecules, the same authors³ attempted a study of certain immunologic reactions with the electron microscope. They obtained micrographs of a mixture of virus and rabbit serum. The virus particles retained their normal size, indicating that little or no adsorption of particles from normal serum on to the virus molecules has taken place. A mixture of tobacco mosaic virus and tobacco mosaic virus antiserum from rabbits, when dried on a collodion film and examined by means of the electron microscope, showed particles about 60 millimicrons wide, about 300 millimicrons long, and having fuzzy profiles. The authors regard the increase in particle width and the fuzzy appearance as indicating that the ends of asymmetrically shaped molecules from the serum react specifically with the antigen molecules. They found further that, when the mixture of antigen and antiserum is applied to a collodion film several hours after mixing, an irregular framework of thickened antigen molecules can be seen. This framework represents the antigen-antiserum precipitate. The authors believe that the electron microscope

will be of greatest value in the microscopy of objects having sizes between about 5 and 250 millimicrons, a range not covered by the light microscope and one in which practically all viruses have been found to fall. The electron microscope offers the possibility of securing micrographs of individual virus particles and thus of establishing their sizes and shapes with some precision. The significance of this newly found sight for all branches of science can scarcely be overestimated.

DISTRIBUTION OF NICOTINIC ACID IN FOODS

Information on the varying amounts of essential dietary factors in foodstuffs is of increasing practical value. For this reason a recent report by Bacharach¹ on the distribution of nicotinic acid in foods is significant. Nicotinic acid or its amide is apparently a dietary essential for man, as it is for the dog, the pig and certain micro-organisms. The importance of nicotinic acid as an etiologic factor in pellagra seems established, although it is true that pellagrins often suffer from a multiple vitamin deficiency. Unfortunately, none of the small standardized laboratory animals are yet available for the biologic assay of nicotinic acid in foods; most of the analytic data available have been obtained with the help of chemical procedures. A number of biologic assays have been conducted with dogs as test animals, however. As pointed out by Bacharach, the degree of agreement between the biologic and some of the chemical methods at least justifies a consideration of the fairly extensive data obtained by the latter type of method.

Yeast is comparatively rich in nicotinic acid, compressed bakers' yeast containing almost 26 mg. per hundred grams and dry bakers' yeast 50 mg. While nicotinic acid is widely distributed in products of plant origin, its concentration therein is usually low. As typical examples may be cited wheat bread, which contains 1.2 mg. of nicotinic acid per hundred grams, white wheat flour about 1 mg., corn flour 0.3 mg., rice powder 1.7 mg., dry peas 1.0 mg., apples less than 0.5 mg., cabbage 0.3 mg. and spinach 1.7 mg. Whole wheat grain contains about 5 mg., raw peanuts 13 mg., and a rice polishings concentrate 140 mg. per hundred grams. The amount of nicotinic acid in products of animal origin likewise shows considerable variation. Milk, for instance, contains 0.5 mg. or less, while in ox liver up to 27.5 mg. per hundred grams has been found.

Data in Bacharach's table indicate that commonly eaten meat products often contain more nicotinic acid on a unit weight basis than do commonly eaten foodstuffs of plant origin. Some of the reported values for the former products are 6.5 to 18.0 mg. for veal, 22.5 mg. for calf liver, 4.7 to 10.4 mg. for ham and 12.8 mg. for ox tongue.

1. Bacharach, H. L.: The Distribution of Nicotinic Acid in Human and Animal Foods, *Nutrition Abstr. & Rev.* **10**: 17 (Jan.) 1941.

2. Stanley, W. M., and Anderson, Thomas F.: A Study of Purified Viruses with the Electron Microscope (from the Department of Animal and Plant Pathology of the Rockefeller Institute for Medical Research, Princeton, and the Laboratories of the Radio Corporation of America, Camden), *J. Biol. Chem.* **139**: 325 (May) 1941.

3. Anderson, Thomas F., and Stanley, W. M.: A Study by Means of the Electron Microscope of the Reaction Between Tobacco Mosaic Virus and Its Antiserum, *J. Biol. Chem.* **139**: 339 (May) 1941.

Current Comment

MR. HEARST CONTINUES TO FILL SPACE WITH PROPAGANDA AGAINST SCIENTIFIC ANIMAL EXPERIMENTATION

Like shadowy wraiths from the long dead past suddenly there appear in Mr. Hearst's column "In the News" the letters against animal experimentation written by doctors, some with but most without scientific standing, who lived many, many years—indeed, two generations—ago. Mr. Hearst's column opens with what is stated to be a quotation from Proverbs: "Let not mercy and truth forsake thee; bind them about thy neck; write them upon the table of thine heart. So shalt thou find favor and good understanding in the sight of God and man." Is there not some literary allusion to the prince of evil being able on necessity to quote Biblical text? And even so, has Mr. Hearst forgotten Matthew 10:31, "Fear ye not therefore; ye are of more value than many sparrows." Many of the physicians quoted by Mr. Hearst were even in the time of their living—long, long ago—known as unbalanced faddists and fanatics. More interesting, however, is the thought whether or not the mind of Mr. Hearst is not also dwelling in those ancient premodern years.

MERCURY IN THE HAT INDUSTRY

After December 1 the use of toxic mercurial compounds in fur carroting operations will be largely eliminated from the hat industry in this country. Satisfactory substitutes have been in use by the majority of the trade for some time and are regarded as safe and economical. On the basis of this accumulated experience, model regulations for adoption by the states were recently approved by representatives of the interested labor organizations and the employers, together with state and federal labor and health officials, acting under the sponsorship of the U. S. Public Health Service. One of the long-established principles of industrial hygiene is to protect workers from harmful exposure by substituting harmless materials or substances of a lower order of toxicity.

ARMY MEDICAL LIBRARY BUILDING

Another step has been taken by Congress toward providing an adequate building for the Army Medical Library and Museum. Apparently in 1938, when the Seventy-Fifth Congress appropriated \$3,750,000 for the new structure, it was contemplated that the building would be constructed on property already owned by the government and hence no provision was made for the purchase of a site. Consideration was given to selecting a site on the Walter Reed Reservation, but this was abandoned because of its inaccessibility to visiting physicians who wish to use the library. The Seventy-Sixth Congress appropriated \$130,000 for personal services and other expenses incidental to the design and preparation of working drawings and specifications of

a building for the Library and Museum. Now, in the Seventy-Seventh Congress, a bill has passed the House (H. R. 5146) amending the 1938 act to authorize an additional appropriation for the purchase of a site for the building. The site, which has been selected by the National Capital Park and Planning Commission, is, it is understood, east of the Folger Library and the annex to the Library of Congress. Preliminary plans for the building have been prepared. Prompt enactment of the pending bill will bring nearer to reality this worthy project, which has already been subject to apparently unnecessary delays.

FAMILY EXPENDITURES FOR MEDICAL CARE

According to a Consumer Purchases Study of the United States Department of Agriculture,¹ "medical care accounted for about 5 per cent of the net income of the native white families of most income levels in both small cities and villages." The study notes that according to the estimates of the Technical Committee on Medical Care "the cost of providing adequate medical services and supplies for a large number of families—those needing much and those needing little care—would be covered by payments of approximately \$100 per family on a group basis." This study found that, while average expenditures of the families with an income below \$2,000 were less than \$100, it was higher in the families with incomes above \$2,500. There is a most casual statement that "perhaps physicians tended to adjust their charges to the smaller incomes of the farm families," but the assumption is continually maintained that money payments measure the quantity of the medical service received. Some of the tables disprove this fact; for example, the number of office visits in the lowest income class is about 60 per cent of that in the highest; the average expenditures per family for office visits is more than five times as much in the higher as in the lower. In the home calls the corresponding difference is between an increase of not quite 40 per cent in the number of calls and almost fivefold in the expenditures. It is claimed that the averages of less than \$100 below the \$2,000 income line "did indicate that the medical care was not generally adequate, that many families must have gone without services and supplies they needed." This decidedly doubtful judgment cannot be accepted as true; if it were, the cost of adequate care would be more than \$100 per family annually, and the total cost for the United States with its forty million families would be much over four billion dollars. There is only the slightest reference to the possibility that many of the lowest income class received medical care from physicians without charge or failed to pay the sums charged. The itemized figures on the costs of medical care classified in a variety of ways should be helpful in actuarial calculations for various types of prepayment plans for medical care.

1. Hollingsworth, Helen; Monroe, Day; Klem, Margaret C., and Benson, Karl L.: Family Expenditures for Medical Care, Miscellaneous Publication 402, United States Department of Agriculture, Bureau of Home Economics, Washington, D. C., Superintendent of Documents, 1941, price 30 cents.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

REPORT OF COMMISSION ON PHYSICAL REHABILITATION

The Commission on Physical Rehabilitation is authoritatively informed that the Army will maintain its present high physical standards of eligibility for military service and will not undertake the rehabilitation after induction of men classified by Selective Service and Army induction boards as having remediable physical handicaps. In making the following recommendations, the commission has therefore been restricted to a program of voluntary physical rehabilitation.

In order to provide information concerning the frequency and the nature of remediable defects among men examined for Selective Service it will be necessary to require physicians of Selective Service and Army induction boards to state in every instance whether the physical handicap responsible for classification IB or IV F is remediable in their opinions. Such registrants should be grouped in a special classification and designated as IB-R and IV F-R. Without this information it will be impossible for states and local communities to prepare plans and to estimate the cost of a rehabilitation program.

The diagnoses recorded on the records of registrants classified in groups IB and IV F by physicians of the Selective Service and Army induction boards give little indication of the possibilities for complete or partial correction. There is a mistaken impression that all registrants in class IV F are not correctable. Actually, registrants in IB have handicaps which restrict their availability to limited forms of military duty, yet the physical disability in some is permanent and nonremediable. Registrants in IV F are suffering from major disabilities which render them incapable of performing any military duties, but some of the men in this category could be restored to group IB or even IA by the correction of their physical handicaps.

The special classification as IB-R and IV F-R will act as an incentive to voluntary correction of remediable physical handicaps. A comprehensive program for physical rehabilitation of the young men of the nation is important in order to maintain effective man power for industry as well as for military service. It will also have an influence in retarding the development of disabilities of middle age which are responsible for an unemployable group in every community.

Experiments in voluntary rehabilitation have been proposed for a few local areas by the American Red Cross and several other agencies. A small experiment in a few selected urban and rural communities will not provide a satisfactory yardstick to estimate the cost for the entire country nor can it provide a reliable answer to the problem. The commission is of the opinion that we must immediately lay the groundwork of comprehensive future plans for physical rehabilitation of our man power by accumulating accurate information in every part of the United States concerning the frequency and the nature of remediable physical disabilities and it therefore submits the following recommendation:

1. Form 200, "report of physical examinations," under the Selective Service and form 221, WD-AGO, "report of induction of Selective Service man," should be amended to contain (a) a place for the examining physician to state whether or not, in his opinion, the physical defect causing rejection is remediable or correctable; (b) the creation of subclassification of IB and IV F (IB-R and IV F-R) to indicate whether or not the regis-

trant is classified as suffering from a remediable or correctable physical defect; (c) statements to be signed by the registrant in these subclassifications relative to (1) his willingness to undergo corrective and remedial procedures, (2) permission for release of information pertinent thereto and (3) whether or not he will provide for appropriate treatment out of his own financial resources.

2. (a) Subparagraph c of paragraph 165 of the Selective Service regulations should be amended to permit the examination at any time of confidential records pertaining to the physical condition of a registrant by the governor of the state or his designated official representative; (b) Subdivision b of paragraph 338 of the Selective Service regulations should be amended to provide appropriate parts of the report of physical examination, form 200, in duplicate, and arrangements be made whereby one form may be retained temporarily for rehabilitation purposes by State Selective Service headquarters and state rehabilitation boards.

3. The following instructions should be issued by the National Director of Selective Service to all local boards: When a local board has finally placed a registrant in class IB-R or IV F-R, the chairman shall write to the registrant advising him of his classification and of the underlying condition that caused such classification, and shall inform him that the condition is considered remediable by the examining physician. He shall also advise the registrant to have the remediable defect corrected by his own physician or dentist or, if the registrant is unable to bear the necessary costs involved, he may have the work performed by applying to the appropriate agency or hospital in his area. For this purpose the state director of Selective Service shall supply all chairmen of local boards with a list of agencies, hospitals or other institutions located in the neighborhood which are prepared to engage in this rehabilitation work during the period of the national emergency. The chairman of the local board shall further advise the registrant of the time that the board has allowed for the correction of his defect, at the expiration of which time the registrant must present himself to the board for reexamination and reclassification.

4. In all states and local areas rehabilitation committees should be created jointly by the Federal Security Agency and the Selective Service System to collaborate with professional groups and with local governmental and voluntary agencies in the development of local rehabilitation facilities.

5. Only a small proportion of the population can afford to pay or will be willing to pay for corrective measures which may make them available for military or industrial service but which do not as yet interfere with their present civilian occupations. Communities differ greatly in the availability of medical facilities, and some states and many local communities will be unable to provide the remedial measures which may be necessary to correct physical handicaps. Because of widespread shifting of population during and after the national emergency, the responsibility is national as well as local. In order to meet the situation realistically it is recommended that Congress enact legislation to defray the cost. As this is primarily a matter of vital necessity for national defense, the cost should be met

directly by federal defense appropriations to the Federal Security Agency, when needed, utilizing fully its available local medical, dental and hospital facilities. Without federal legislation of this nature, it can be predicted that little progress in voluntary physical rehabilitation is to be expected.

In the opinion of the commission the alternative to such a voluntary program is lower physical standards of eligibility for selective service and compulsory physical rehabilitation after induction into the Army. Action is required along the lines of one or other of these alternatives, for the present standards

of physical eligibility have reduced the nation's reservoir of eligible registrants to a number far lower than had been anticipated.

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PREHABILITATION OF REGISTRANTS

IV. DENTAL REQUIREMENTS AND ADVICE

The Dental Advisory Committee to the Selective Service offers here a simple plan whereby registrants themselves may insure their own dental fitness.

The Prehabilitation Plan of Selective Service aims to permit registrants to fit themselves for military examination and service by making them familiar with the standards required and through advice as to how they can find the help necessary to remedy their remediable defects. The prehabilitation plan includes the problem of dentistry as well as of medicine. This plan is applicable to dentistry as to medicine, since the same principles are concerned; in fact, it might be more widely applicable because the teeth are such frequent offenders. More registrants are rejected for poor or insufficient teeth than for any other one reason. In fact, two out of every five are rejected for dental defects.

DENTAL STANDARDS

While it is hoped that registrants will have normal or near normal teeth and gums, the Selective Service System has established minimum dental requirements in keeping with those of the Army for the guidance of the local and advisory board examiners in the selection or rejection of men. These requirements are listed here.

No one will be accepted for service who has less than three front teeth of the cutting variety above and three front teeth below. The edge of the lower teeth must meet the edges of the upper teeth or sit slightly in back of them. Furthermore, no one will be accepted who does not have three upper and three lower back teeth (of the chewing variety) which oppose each other when the jaws are in normal movement. This means, then, that the registrant to be considered for government military service must have at least twelve teeth of the kind specified.

These twelve, or more, teeth must be sound. If they have good fillings or crowns and are free from infection, they will be considered satisfactory. The teeth must be clean and tight in the gums, and the gums must have a normal, healthy appearance.

The government supposes that each young man having too few teeth has already had or will have his family dentist, or some agency or institution, construct plates or bridges to sit on the gums where the crucial teeth are missing. Plates should have clasps (rings) which fit over some of the twelve teeth so that the chewing load will be taken up by both the gums and the teeth and yield a satisfactory dental function.

Decayed Teeth.—Care of Cavities: If any of the twelve teeth have cavities or present dark spots, the registrant should by all means see a dentist so that proper treatment may be completed. The modern dentist is a considerate individual who will do everything in his power to protect you from pain. Dental care of today does not involve the same degree of discomfort as the old fashioned care of yesterday.

When the registrant has teeth in excess of the minimum requirements they should be prized most highly and always kept clean and in good order. They should be accorded the same care as would be given any other cherished possession of great value.

Useful Teeth.—On meeting people, fine, clean, well cared for teeth are among the first things noticed. Teeth add materially to personal appearance as well as serving for eating purposes. Even artificial teeth, when set in the proper spaces and when well matched in color, add much of value to one's appearance and also to health. One of the most important things that a registrant can do for himself is to see that his teeth are properly cared for. All vacancies resulting from extraction should be filled with good dental pontic bridgework or partial plates with clasps.

During examination the registrant should demonstrate to the examiner that he can move his jaws sideways and forward so that certain upper and lower teeth will meet and can thus be used for the purposes of cutting and grinding the food. This is important to the registrant in many instances, particularly when there are few teeth.

Healthy Teeth.—The registrant should see that the teeth are put in first class condition by a dentist who can make sure that the gums are healthy and that any infection which was present has received proper and adequate treatment.

The first rule for keeping the gums healthy is a thorough brushing with a small, strong toothbrush. Dirty teeth eventually lead to cavities and infected gums. Teeth and gums should be brushed after each meal, also before retiring. Probably the greatest cause for decay of teeth is the remnant of food particles left on the teeth. If the food is allowed to decay, the teeth will decay under the food and the gums may become infected, so to keep well and normally healthy pay strict attention to the cleanliness of your teeth.

Weak Teeth.—Teeth which have not come through the gums are said to be impacted or unerupted. Additional teeth are called supernumerary. Such teeth often cause jaw pains, neuralgia, eye trouble, severe unexplainable headaches and other body ailments. In some instances the dentist can bring these teeth through the gums so that they can function and do actually take the place of teeth that are missing. In other instances such teeth may have to be removed. Whatever the remedy, it is wisest to do something about them if you have such teeth.

Infected Teeth.—Many times, teeth are broken off and the roots are left embedded in the gums. These should be removed as a rule because they may be infected. Such teeth and roots may cause infections in the mouth, swellings, growths or even tumors in the jaw, in the cheeks or in the glands that supply the saliva. Such swellings are often disfiguring and may even suggest deformities. In order to be certain about teeth, they should be examined at once and thereafter at least every year. Roentgenograms are useful in detecting cavities, infections or growths, if they are of consequence, which otherwise may not be seen.

Crooked Teeth.—Small underdeveloped or large overdeveloped jaws, with retruding or protruding upper teeth that fail to meet the lower front teeth on any jaw movement, can be corrected so that the teeth will come together. Normally the upper front teeth should overlap one third of the lower front teeth when the jaw is closed. Many dentists render service of this kind. A dentist who does not conduct a general dental practice but who specializes in the straightening of teeth is called an orthodontist. Crooked teeth, teeth that do not meet,

and deformed teeth and jaws can be corrected as a rule by the family dentist. If special skill is required, the orthodontist should be called in. While crooked teeth may be straightened in childhood, it is still possible to accomplish much in certain instances even in adult life. Many registrants could undergo this kind of treatment to advantage.

Preventive Dentistry.—By attending to these simple dental needs you can improve yourself, your appearance and your health. You can prepare yourself for examination and for service in the defense of your country in this unlimited emergency or improve yourself for work in civil life. In doing this, you will be practicing personal preventive dentistry. This, in turn, will redound to your own personal benefit now and in the future. If you take care of your dental defects early, that is, as soon as they are discovered, you may protect yourself from future disease of a more serious nature which will be more expensive and more difficult to treat.

Bad teeth and gums constitute a hazard which should not be tolerated, because they frequently lead to illnesses which make the individual unfit for service of any kind, the office, farm, factory or armed forces. You may think that you can "get by" with dental diseases and still carry on. Possibly you can for a while, but under such circumstances you may not be as fit or as efficient as you think. Certainly you are not fit enough

for the armed forces or for any form of strenuous life. You will not be considered fit enough for service—even for limited service. It is questionable also whether you will retain the health necessary to work on the farm, in the office or in industry. As the years pass many illnesses may beset you because of the presence of infected and neglected teeth which might have been avoided had these dental defects been corrected in early life. Why not face the issue squarely now, dispose of the dental defects immediately and fit yourself for service and for better health?

Dental Advice.—If you are interested in restoring and conserving your dental health you should visit a local dentist for advice and for recommendations as to treatment.

SUMMARY

If you will regard your body as your most priceless personal possession and then give it the care you would expend on any other cherished possession, you should become a strong citizen, well equipped to answer any call, civil or military. Your health and welfare are in your hands to dispose of as you see fit.

Remember this: The health of your teeth is essential to the health of your body. The health of your body is at present of crucial consequence to the welfare of your country in its plan of national defense.

SOLDIERS TO RECEIVE TEST TO DETERMINE BLOOD TYPE

Each soldier on active duty in the United States Army will be given a test to determine his blood type in order that transfusions may be given without delay at the time of an accident, the War Department has announced. It will be possible to identify the various types of human blood for the entire army personnel more expeditiously and more economically than has been possible previously. The results of each test will be embossed on the individual's identification tag as soon as his blood type is determined.

It is expected that the necessary serums and equipment will be ready for use by the middle of July. Under the previous method of using human blood serums, which were in liquid form and had to be kept refrigerated, an average observation period of a half an hour was required for results, and microscopic readings were necessary. The new method uses dried serums and gives results in about thirty seconds. No microscopic reading is necessary. A further advantage of the dried serums is that they can be kept without refrigeration and are more stable over a longer period. At least one hundred thousand men a week can be typed and the tests will be conducted as rapidly as serums are made available. The International or Landsteiner classification will be used and the results recorded by the symbols A, B, AB or O.

GUY'S IN THE COUNTRY

Guy's Hospital in London, like many other hospitals, has suffered so much from German bombs that an annex to this famous hospital has been established in the country about 25 miles out of London. A fine old country mansion is being adapted to provide a hospital of one hundred and ten beds. The windows look out over wooded downland, a very different view from that which meets the eyes from the windows of the venerable hospital in London since German bombs have widened the horizon. On the first floor of the country site are large bedrooms and private suites which will provide a number of small wards, rooms for the resident staff, and operating rooms. The second floor provides quarters for forty nurses and the basement for kitchens, dining rooms, laboratories and air raid shelter. There is no elevator big enough to take a bed or stretcher, but the staircase is wide; and so the continuity of Guy's Hospital, which has been unbroken for two hundred years, shall be maintained.

An American organization, "Bundles for Britain," has become keenly interested. Its Hollywood branch has adopted Guy's and will present the additional equipment needed. According to the *Lancet*, May 24, an initial gift of \$10,000 will equip the operating room and provide a high voltage roentgen ray plant.

Other expensive instruments and furniture have been promised. The annex, in appreciation of these gifts, has been named "Guy's U. S. A. Hospital." The high voltage plant will be housed in a hut especially erected and communicating with the main building by a covered way. The old roentgen ray plant was destroyed by fire some months ago. For the present, only inpatients will be taken at the country site, for the most part air raid casualties, and the sick on its outpatient waiting list.

An American ambulance presented to Guy's by New York friends may make possible a daily ambulance service between Guy's in London and Guy's in the country. While the annex is too small to house any part of the medical school, some members of Guy's teaching staff will take their students out to Guy's in the country for ward rounds, so that it will still play at least a small part in medical education.

MEDICAL ASPECTS OF CIVILIAN DEFENSE

The Office of Civilian Defense and the United States Public Health Service jointly announce the appointment of Dr. George Baehr of New York as medical director in the U. S. Public Health Service in charge of the medical aspects of civilian defense. In this capacity he will act as chief medical officer in the Office of Civilian Defense, under the U. S. director of the Office of Civilian Defense, Mayor F. H. LaGuardia, and will coordinate the activities of these two governmental agencies in their related fields. Surg. Gen. Thomas Parran has assigned to Dr. Baehr several Public Health Service officers for the Washington and the New York offices of the Office of Civilian Defense as well as the liaison health officers recently detailed to each of the nine Army Corps areas.

Dr. Baehr is being assisted by an Advisory Medical Board recently appointed by Mayor LaGuardia, which includes Dr. Elliott C. Cutler of Boston, Dr. Oliver Kiel of Wichita Falls, Texas, Dr. Albert McCown of Washington, D. C. Mayor LaGuardia plans to enlarge the board by the appointment of Dr. Fred Rankin, President-Elect of the American Medical Association, and Dr. R. C. Buerki of the American Hospital Association.

The work of the Office of Civilian Defense in the field of medicine and public health will be concerned largely with the development of plans and facilities for disaster relief in the cities, beginning with those along both seaboards. Preparation of these plans is already well advanced and they will be announced shortly. In order that the facilities for disaster relief and their administration throughout the country may fit into a common pattern, all states and local communities are advised to adopt the recommendations of the Office of Civilian Defense. Although the British experiences will be utilized, plans for the

directly by federal defense appropriations to the Federal Security Agency, when needed, utilizing fully its available local medical, dental and hospital facilities. Without federal legislation of this nature, it can be predicted that little progress in voluntary physical rehabilitation is to be expected.

In the opinion of the commission the alternative to such a voluntary program is lower physical standards of eligibility for selective service and compulsory physical rehabilitation after induction into the Army. Action is required along the lines of one or other of these alternatives, for the present standards

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These twelve, or more, teeth must be sound. If they have good fillings or crowns and are free from infection, they will be considered satisfactory. The teeth must be clean and tight in the gums, and the gums must have a normal, healthy appearance.

The government supposes that each young man having too few teeth has already had or will have his family dentist, or some agency or institution, construct plates or bridges to sit on the gums where the crucial teeth are missing. Plates should have clasps (rings) which fit over some of the twelve teeth so that the chewing load will be taken up by both the gums and the teeth and yield a satisfactory dental function.

Decayed Teeth.—Care of Cavities: If any of the twelve teeth have cavities or present dark spots, the registrant should by all means see a dentist so that proper treatment may be completed. The modern dentist is a considerate individual who will do everything in his power to protect you from pain. Dental care of today does not involve the same degree of discomfort as the old fashioned care of yesterday.

When the registrant has teeth in excess of the minimum requirements they should be prized most highly and always kept clean and in good order. They should be accorded the same care as would be given any other cherished possession of great value.

Useful Teeth.—On meeting people, fine, clean, well cared for teeth are among the first things noticed. Teeth add materially to personal appearance as well as serving for eating purposes. Even artificial teeth, when set in the proper spaces and when well matched in color, add much of value to one's appearance and also to health. One of the most important things that a registrant can do for himself is to see that his teeth are properly cared for. All vacancies resulting from extraction should be filled with good dental pontic bridgework or partial plates with clasps.

During examination the registrant should demonstrate to the examiner that he can move his jaws sideways and forward so that certain upper and lower teeth will meet and can thus be used for the purposes of cutting and grinding the food. This is important to the registrant in many instances, particularly when there are few teeth.

Healthy Teeth.—The registrant should see that the teeth are put in first class condition by a dentist who can make sure that the gums are healthy and that any infection which was present has received proper and adequate treatment.

The first rule for keeping the gums healthy is a thorough brushing with a small, strong toothbrush. Dirty teeth eventually lead to cavities and infected gums. Teeth and gums should be brushed after each meal, also before retiring. Probably the greatest cause for decay of teeth is the remnant of food particles left on the teeth. If the food is allowed to decay, the teeth will decay under the food and the gums may become infected, so to keep well and normally healthy pay strict attention to the cleanliness of your teeth.

Freak Teeth.—Teeth which have not come through the gums are said to be impacted or unerupted. Additional teeth are called supernumerary. Such teeth often cause jaw pains, neuralgia, eye trouble, severe unexplainable headaches and other body ailments. In some instances the dentist can bring these teeth through the gums so that they can function and do actually take the place of teeth that are missing. In other instances such teeth may have to be removed. Whatever the remedy, it is wisest to do something about them if you have such teeth.

Infected Teeth.—Many times, teeth are broken off and the roots are left embedded in the gums. These should be removed as a rule because they may be infected. Such teeth and roots may cause infections in the mouth, swellings, growths or even tumors in the jaw, in the cheeks or in the glands that supply the saliva. Such swellings are often disfiguring and may even suggest deformities. In order to be certain about teeth, they should be examined at once and thereafter at least every year. Roentgenograms are useful in detecting cavities, infections or growths, if they are of consequence, which otherwise may not be seen.

Crooked Teeth.—Small underdeveloped or large overdeveloped jaws, with retruding or protruding upper teeth that fail to meet the lower front teeth on any jaw movement, can be corrected so that the teeth will come together. Normally the upper front teeth should overlap one third of the lower front teeth when the jaw is closed. Many dentists render service of this kind. A dentist who does not conduct a general dental practice but who specializes in the straightening of teeth is called an orthodontist. Crooked teeth, teeth that do not meet,

and deformed teeth and jaws can be corrected as a rule by the family dentist. If special skill is required, the orthodontist should be called in. While crooked teeth may be straightened in childhood, it is still possible to accomplish much in certain instances even in adult life. Many registrants could undergo this kind of treatment to advantage.

Preventive Dentistry.—By attending to these simple dental needs you can improve yourself, your appearance and your health. You can prepare yourself for examination and for service in the defense of your country in this unlimited emergency or improve yourself for work in civil life. In doing this, you will be practicing personal preventive dentistry. This, in turn, will redound to your own personal benefit now and in the future. If you take care of your dental defects early, that is, as soon as they are discovered, you may protect yourself from future disease of a more serious nature which will be more expensive and more difficult to treat.

Bad teeth and gums constitute a hazard which should not be tolerated, because they frequently lead to illnesses which make the individual unfit for service of any kind, the office, farm, factory or armed forces. You may think that you can "get by" with dental diseases and still carry on. Possibly you can for a while, but under such circumstances you may not be as fit or as efficient as you think. Certainly you are not fit enough

for the armed forces or for any form of strenuous life. You will not be considered fit enough for service—even for limited service. It is questionable also whether you will retain the health necessary to work on the farm, in the office or in industry. As the years pass many illnesses may beset you because of the presence of infected and neglected teeth which might have been avoided had these dental defects been corrected in early life. Why not face the issue squarely now, dispose of the dental defects immediately and fit yourself for service and for better health?

Dental Advice.—If you are interested in restoring and conserving your dental health you should visit a local dentist for advice and for recommendations as to treatment.

SUMMARY

If you will regard your body as your most priceless personal possession and then give it the care you would expend on any other cherished possession, you should become a strong citizen, well equipped to answer any call, civil or military. Your health and welfare are in your hands to dispose of as you see fit.

Remember this: The health of your teeth is essential to the health of your body. The health of your body is at present of crucial consequence to the welfare of your country in its plan of national defense.

SOLDIERS TO RECEIVE TEST TO DETERMINE BLOOD TYPE

Each soldier on active duty in the United States Army will be given a test to determine his blood type in order that transfusions may be given without delay at the time of an accident, the War Department has announced. It will be possible to identify the various types of human blood for the entire army personnel more expeditiously and more economically than has been possible previously. The results of each test will be embossed on the individual's identification tag as soon as his blood type is determined.

It is expected that the necessary serums and equipment will be ready for use by the middle of July. Under the previous method of using human blood serums, which were in liquid form and had to be kept refrigerated, an average observation period of a half an hour was required for results, and microscopic readings were necessary. The new method uses dried serums and gives results in about thirty seconds. No microscopic reading is necessary. A further advantage of the dried serums is that they can be kept without refrigeration and are more stable over a longer period. At least one hundred thousand men a week can be typed and the tests will be conducted as rapidly as serums are made available. The International or Landsteiner classification will be used and the results recorded by the symbols A, B, AB or O.

GUY'S IN THE COUNTRY

Guy's Hospital in London, like many other hospitals, has suffered so much from German bombs that an annex to this famous hospital has been established in the country about 25 miles out of London. A fine old country mansion is being adapted to provide a hospital of one hundred and ten beds. The windows look out over wooded downland, a very different view from that which meets the eyes from the windows of the venerable hospital in London since German bombs have widened the horizon. On the first floor of the country site are large bedrooms and private suites which will provide a number of small wards, rooms for the resident staff, and operating rooms. The second floor provides quarters for forty nurses and the basement for kitchens, dining rooms, laboratories and air raid shelter. There is no elevator big enough to take a bed or stretcher, but the staircase is wide; and so the continuity of Guy's Hospital, which has been unbroken for two hundred years, shall be maintained.

An American organization, "Bundles for Britain," has become keenly interested. Its Hollywood branch has adopted Guy's and will present the additional equipment needed. According to the *Lancet*, May 24, an initial gift of \$10,000 will equip the operating room and provide a high voltage roentgen ray plant.

Other expensive instruments and furniture have been promised. The annex, in appreciation of these gifts, has been named "Guy's U. S. A. Hospital." The high voltage plant will be housed in a hut especially erected and communicating with the main building by a covered way. The old roentgen ray plant was destroyed by fire some months ago. For the present, only inpatients will be taken at the country site, for the most part air raid casualties, and the sick on its outpatient waiting list.

An American ambulance presented to Guy's by New York friends may make possible a daily ambulance service between Guy's in London and Guy's in the country. While the annex is too small to house any part of the medical school, some members of Guy's teaching staff will take their students out to Guy's in the country for ward rounds, so that it will still play at least a small part in medical education.

MEDICAL ASPECTS OF CIVILIAN DEFENSE

The Office of Civilian Defense and the United States Public Health Service jointly announce the appointment of Dr. George Baehr of New York as medical director in the U. S. Public Health Service in charge of the medical aspects of civilian defense. In this capacity he will act as chief medical officer in the Office of Civilian Defense, under the U. S. director of the Office of Civilian Defense, Mayor F. H. LaGuardia, and will coordinate the activities of these two governmental agencies in their related fields. Surg. Gen. Thomas Parran has assigned to Dr. Baehr several Public Health Service officers for the Washington and the New York offices of the Office of Civilian Defense as well as the liaison health officers recently detailed to each of the nine Army Corps areas.

Dr. Baehr is being assisted by an Advisory Medical Board recently appointed by Mayor LaGuardia, which includes Dr. Elliott C. Cutler of Boston, Dr. Oliver Kiel of Wichita Falls, Texas, Dr. Albert McCown of Washington, D. C. Mayor LaGuardia plans to enlarge the board by the appointment of Dr. Fred Rankin, President-Elect of the American Medical Association, and Dr. R. C. Buerki of the American Hospital Association.

The work of the Office of Civilian Defense in the field of medicine and public health will be concerned largely with the development of plans and facilities for disaster relief in the cities, beginning with those along both seaboards. Preparation of these plans is already well advanced and they will be announced shortly. In order that the facilities for disaster relief and their administration throughout the country may fit into a common pattern, all states and local communities are advised to adopt the recommendations of the Office of Civilian Defense. Although the British experiences will be utilized, plans for the

United States will be adapted to the existing organizational pattern of the state and local governments of the country.

The medical equipment for disaster relief will be standardized in conformity with the experience of the Army and the American Red Cross so that an adequate supply may be provided to meet any future need. The Office of Civilian Defense will shortly announce the adoption of a standard stretcher, standard stretcher racks to permit the transportation of 4 stretcher patients in station wagons and small trucks, standard first aid kits patterned after those of the American Red Cross, standard equipment for first aid posts or casualty clearing stations, and so on.

An intensification of the first aid training program is projected which will include the preparation of a brief course of instruction for the general public; some persons may not require the standard and advanced courses of the American Red Cross. Training courses for volunteer nurses' aides will immediately be extended and placed on a practical basis.

MEDICAL STUDENTS TO BE TRANSFERRED TO RESERVE POOL

On June 18 the War Department rescinded an authorization dated May 26, 1941 pertaining to the appointment of medical students as second lieutenants in the Medical Administrative Corps and substituted other authorizations. Now medical students who are appointed as reserve officers in the Medical Administrative Corps will be transferred to the War Department Reserve Pool and retained there until eligible for appointment in the Medical Corps Reserve or until discharged. These appointments will be made without reference to an examining board as prescribed in army regulations, and corps area commanders are authorized to waive the minimum qualifications for appointment of physically qualified male citizens who have successfully completed the first two years in approved medical schools within the United States. Applications for appointment, together with a report of physical examination, should be forwarded by the dean of the medical school to the commander of the corps area in which the school is located, together with a certified statement that the applicant has completed the first two years of medical instruction and is an accredited student in the last two years of medicine at the institution.

Officers appointed under this authorization and transferred to the reserve pool will be discharged for the convenience of the government from the reserve corps on matriculation in an unapproved medical school or on failure to complete successfully the four year course in medicine or on discontinuance of their medical education or on failure to be appointed in the Medical Reserve Corps within one year after completion of the four year medical course.

SURVEY OF MEDICAL SERVICES IN INDUSTRY

Arrangements were recently completed between the Public Health Service and the Metropolitan Life Insurance Company whereby Dr. W. J. McConnell of the latter organization will be appointed a consultant to the Division of Industrial Hygiene of the National Institute of Health. Dr. McConnell, in cooperation with the division, will direct a nationwide survey of present day medical service facilities in industry. The purpose of this cooperative investigation is to obtain information on which standards for health maintenance programs in various types and sizes of industry may be based.

CHANGES IN PERSONNEL IN SURGEON GENERAL'S OFFICE

Col. John A. Rogers, M. C., new executive officer in the Surgeon General's Office, Washington, D. C., reported for duty, June 23, succeeding Brig. Gen. Larry B. McAfee, who will succeed Brig. Gen. Albert G. Love as chief of plans and training division. General Love will retire July 31, when he

will reach the statutory age limit. Other new officers in the Surgeon General's Office are Major Charles L. Lcedham in the professional services division and Capt. Tom F. Whayne in the preventive medicine division. Major Ernest D. Liston will continue as assistant executive officer.

SUBCOMMITTEE ON INDUSTRIAL HEALTH AND MEDICINE

On June 20-21 the Subcommittee on Industrial Health and Medicine of the Health and Medical Committee met in Detroit with liaison officers from the U. S. Public Health Service, the U. S. Army and the National Research Council. A progress report on the activities of the Division of Industrial Hygiene of the National Institute of Health in the national defense program was made. A number of defense industries in the area were visited for the purpose of observing model medical and industrial hygiene services in these plants.

The subcommittee plans to meet again in September in Connecticut, at which time it will visit key defense industries to determine to what extent medical and industrial hygiene services are being provided for employees.

MEDICAL DEPOT MOVED TO ST. LOUIS

The War Department has purchased a building in St. Louis, at a cost of \$2,300,000, which it plans to use as the main medical depot in the United States. While the main medical depot is being moved from the New York Port of Embarkment to St. Louis, a smaller independent medical depot will be maintained in New York. The St. Louis location, on account of its central location and exceptional railroad facilities, is expected to function more efficiently than the old depot in New York.

OFFICE OF DERMATOSES INVESTIGATIONS

On June 13 the Office of Dermatoses Investigations of the National Institute of Health was transferred from the Division of Infectious Diseases to the Division of Industrial Hygiene. This office will function as a third section of the division, to be known as the Dermatoses Investigations Section, with Medical Director Louis Schwartz in charge.

FREE FRENCH TO GET ROENTGEN RAY UNIT

The Free French Forces in Brazzaville, French Equatorial Africa, will soon receive the most modern army field roentgen unit developed in the United States.

Work was completed on the outfit, July 5, at a cost of \$2,600, given by American donors and raised by the British American Ambulance Corps, 420 Lexington Avenue, New York. The outfit was developed by Dr. Harry F. Waite, with B. A. Birnbaum designing the trailer body, both members of the Picker X-Ray Corporation. The unit is equipped to do emergency work both in fluoroscopy and in roentgenography. There is a dark room and equipment for rapid developing, drying and viewing of negatives. The outfit has its own generating plant; in fact the generating plant may be used to supply current to outside sources.

INVESTIGATION OF HEALTH HAZARDS IN MUNITIONS PLANTS

Studies of industrial health hazards in ordnance establishments, in industrial plants of the Air Corps and at Quartermaster Corps depots are being made by the Division of Industrial Hygiene of the National Institute of Health, in cooperation with the Office of the Surgeon General of the Army. At present one mobile unit is investigating health conditions at the ordnance depots at Ogden, Utah; Benicia, Calif.; Fort Wingate, New Mexico, and at McClelland Field, Sacramento, Calif. A second mobile unit is working at Frankford Arsenal at Philadelphia, and a third unit has just completed studies at the Holabird Quartermaster Corps Depot at Baltimore. A fourth unit started operation in New England arsenals on June 30.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY

WAR DEPARTMENT

The following additional medical reserve corps officers have been ordered to extended active duty by the War Department, Washington, D. C.:

ANDERSON, Melvin Walter, 1st Lieut., Portland, Maine.
BELLIS, Carroll Joseph, 1st Lieut., St. Paul.
CROSBY, William Holmes, Jr., 1st Lieut., Oil City, Pa.
DALY, John Nicol, 1st Lieut., Rochester, N. Y.
EMMERT, Max Walter, Jr., 1st Lieut., Birmingham, Ala.
EVANS, Albert Louis, 1st Lieut., Sandersville, Ga.
EVANS, William Dustin, 1st Lieut., Los Angeles.
HAUSER, Isadore Jerome, 1st Lieut., Detroit.
HOLMES, Robert Hicks, 1st Lieut., Lumberton, N. C.
HURSH, Laurence Mercer, 1st Lieut., Hibbing, Minn.
KIERSCH, Theodore Alexander, 1st Lieut., El Paso, Texas.
LEGOLVAN, Paul Celestin, 1st Lieut., Marquette, Mich.
MEAD, James G., 1st Lieut., Yorktown Heights, N. Y.
MERRITT, Robert Edward, 1st Lieut., San Francisco.
ORBISON, J. Archer, 1st Lieut., Ann Arbor, Mich.
RISER, William Henry, Jr., 1st Lieut., Lafayette, Ala.

FIRST CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, First Corps Area, which comprises the states of Maine, Vermont, New Hampshire, Rhode Island, Massachusetts and Connecticut:

BLAIS, Wilfred A., Lieut., Pittsfield, Mass., Fort Banks, Mass.
CORBIN, Stuart S., Lieut., Burlington, Vt., Fort Ethan Allen, Vt.
DELGREGO, Arthur L., Major, Hamden, Conn., Fort George G. Meade, Md.
EWELL, John W., Lieut., Rowley, Mass., Camp Forrest, Tenn.
FEINMAN, Maxwell H., Lieut., Lynn, Mass., Fort Oglethorpe, Ga.
FISHER, Samson, Lieut., Oakland, Maine, Maxwell Field, Ala.
HUSSEY, Earle U., Captain, Lynn, Mass., Camp Edwards, Mass.
HYLAN, Nathan W., Lieut., Derry Village, N. H., Fort Williams, Maine.
IRGENS, Edwin R., Lieut., Waterville, Maine, Fort Williams, Maine.
LAWRY, Oram R., Jr., Lieut., Portland, Maine, Camp Forrest, Tenn.
MONGILLO, Frank, Major, New Haven, Conn., Fort George G. Meade, Md.
MORIARTY, Patrick M., Major, Chicopee, Mass., Fort Adams, R. I.
PULMAN, Peter B., Major, West Hartford, Conn., Fort George G. Meade, Md.

THIRD CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Third Corps Area, which comprises the states of Pennsylvania, Virginia, District of Columbia and Maryland:

BEHREND, Albert, 1st Lieut., Philadelphia, Carlisle Barracks, Pa.
BRANT, Carl Ernest, 1st Lieut., Greensburg, Pa., Fort George G. Meade, Md.
COMESS, William, 1st Lieut., York, Pa., Fort George G. Meade, Md.
DALTON, Horace Milton, 1st Lieut., Charlottesville, Va., Indiantown Gap Military Reservation, Pa.
EVASHWICK, George, 1st Lieut., Turtle Creek, Pa., Aberdeen Proving Ground, Md.
EVERIART, Wilson Christian, 1st Lieut., Pittsburgh, Fort George G. Meade, Md.
GROSS, Cyril Vogel, 1st Lieut., Philadelphia, Camp Shelby, Miss.
HARBOLD, Harold Valentine, 1st Lieut., York, Pa., Indiantown Gap Military Reservation, Pa.
HAUSE, Welland Angel, 1st Lieut., Angels, Pa., Fort Story, Va.
HOOKER, Charles Bullard, 1st Lieut., Washington, D. C., Edgewood Arsenal, Md.
KURLAND, Albert Alexander, 1st Lieut., Baltimore, Fort George G. Meade, Md.
LAUGHLIN, Robert Miller, 1st Lieut., Pittsburgh, Aberdeen Proving Ground, Md.
MCDONALD, Roland John, 1st Lieut., McAdoo, Pa., Fort George G. Meade, Md.

ORDERED TO FOREIGN DUTY

CUVILLIER, Louis Marshall, Jr., 1st Lieut., Washington, D. C., Hickam Field, Hawaii.
DUNKLE, Philip Lee, 1st Lieut., Hebron, N. H., Borinquen Field, Puerto Rico.
HARRIS, Frank Henry, 1st Lieut., Wheeling, W. Va., Station Hospital, Schofield Barracks, Honolulu, Hawaii.
KATZ, Charles Joseph, 1st Lieut., Fort Bliss, Texas, Transport Service Manila, Philippine Islands.
LYTLE, Robert Pinkerton, Captain, Cleveland, Borinquen Field, Puerto Rico.

ROYALS, James Lee, 1st Lieut., Meridian, Miss.
SCHINDLER, J. A., 1st Lieut., Pittsburgh.
SCHLECTE, Marvin Charles, 1st Lieut., San Antonio, Texas.
SERETAN, Edward Lloyd, 1st Lieut., New York.
SWINDLER, Charles Mathews, 1st Lieut., Pittsburgh.
TRUPP, Mason, 1st Lieut., Atlanta, Ga.
UHRICH, Gerard Ignatius, 1st Lieut., Atlanta, Ga.
WILLIAMS, Ben Clayton, 1st Lieut., Baltimore.

Orders Revoked

COSBY, Oswald W., Captain, Baton Rouge, La.
DICKSON, Douglas D., 1st Lieut., Oakland, Calif.
EVERETT, Peter, Captain, New Orleans.
KAUFMANN, Maurice, Captain, Waverly Hills, Ky.
LYTTON, William Bryan, Jr., 1st Lieut., Webster Grove, Mo.
MATHIS, Earl N., 1st Lieut., San Francisco.
POTTER, Harold Walter, Lieut. Colonel, Newport News, Va.
RINGNESS, Henry Raymond, 1st Lieut., Washington, D. C.
THOMAS, Herbert H., Jr., 1st Lieut., Myrtle Point, Ore.
VOTAW, Frederick L., 1st Lieut., Franklin, Pa.
WISE, Albert W., 1st Lieut., Davenport, Iowa.

ROBISON, Roy C., Lieut., New Canaan, Conn., Fort Ethan Allen, Vt.
SCHILLANDER, Carl A., Captain, Springfield, Mass., Camp Edwards, Mass.
WALSH, Maurice J., Lieut., Burlington, Vt., Fort Ethan Allen, Vt.

Orders Revoked

ANDERSON, Justin L., Lieut., Reading, Mass.
CORBIN, Stuart S., Lieut., Burlington, Vt.
CUTLER, Isadore L., Lieut., Rutland, Vt.
DURGIN, Lawrence N., Captain, Amherst, Mass.
DURLACHER, Stanley H., Lieut., New Haven, Conn.
EASTMAN, Oliver R., Lieut., Burlington, Vt.
GUDGER, James R., Captain, West Hartford, Conn.
HANSELL, Howard R., Lieut., Sharon, Conn.
KNOX, Barron D., Lieut., Holyoke, Mass.
KREIDBERG, Marshall B., Lieut., Dorchester, Mass.
LEWIS, Henry R., Lieut., Wethersfield, Conn.
MILLSTEIN, Hyman, Lieut., Southwest Harbor, Maine.
MOORE, Kenneth T., Lieut., Providence, R. I.
SMERZ, Anton, Lieut., Worcester, Mass.
THORNE, Lewis, Lieut., New Haven, Conn.

MORSE, Robert Thatcher, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.
MOSER, George Paul, 1st Lieut., Bloomsburg, Pa., Carlisle Barracks, Pa.
MOYER, Forrest George, 1st Lieut., Allentown, Pa., Camp Stewart, Ga.
SCHEIN, George Clarence, Captain, Pittsburgh, Fort Story, Va.
WIDOME, Allen, 1st Lieut., Washington, D. C., Fort Eustis, Va.
ZEMAN, Erwin Doehren, 1st Lieut., Erie, Pa., Fort Story, Va.

Orders Revoked

BASTACKY, Morris, 1st Lieut., Pittsburgh.
CHASE, William D., 1st Lieut., McLean, Va.
DUNN, John N., Captain, Blackstone, Va.
HEIGES, Harold Lynwood, 1st Lieut., Washington, D. C.
JONES, Donald Emerson, 1st Lieut., Mount Pleasant, Pa.
LOGAN, Thomas Megowan, Captain, Philadelphia.
MANCUSO, Joseph A., 1st Lieut., Meadville, Pa.
MASON, John Henry, Jr., 1st Lieut., Mayview, Pa.
MONTGOMERY, Edward S., 1st Lieut., Tarentum, Pa.
MORSE, Robert Thatcher, 1st Lieut., Washington, D. C.
OMBRES, Severn Richard, 1st Lieut., Meadville, Pa.
PRESTON, Henry Grant, 1st Lieut., Harrisonburg, Va.
RAPEE, Lawrence Albert, 1st Lieut., Washington, D. C.
RUSSO, Albert J., 1st Lieut., Wilkes-Barre, Pa.
SICA, Paul A., 1st Lieut., Mount Lebanon, Pa.
STEINMETZ, Henry G., Captain, Arlington, Va.
THOMAS, John L., 1st Lieut., Greenville, Pa.
UPDEGRAFF, Harry Beshore, 1st Lieut., Millersburg, Pa.
WARREN, Charles W., 1st Lieut., Upperville, Va.

MANGIMELLI, Samuel Thomas, 1st Lieut., Omaha, Camp Parris, Canal Zone.

SMITH, Jack Irvin, 1st Lieut., Mooresville, Ala., Air Base, Ponce, Puerto Rico.

WILBUR, WALTER IRVING, 1st Lieut., Portland, Ore., Station Hospital, Fort Richardson, Anchorage, Alaska.

WONG, James Sin Fook, Captain, Philadelphia, Hawaiian Department, Fort Shafter, Honolulu, Hawaii.

ORGANIZATION SECTION

FEDERAL GRANTS TO STATES FOR PUBLIC HEALTH WORK

AN ANALYSIS BY THE BUREAU OF LEGAL MEDICINE AND LEGISLATION

For the fiscal year ending June 30, 1942, the sum of \$11,000,000 has been made available by the Congress to assist states, counties, health districts and other political subdivisions of the states in establishing and maintaining adequate public health activities, including the training of personnel for state and local public health work.¹ Under the provisions of the Social Security Act, as amended, the Surgeon General of the United States Public Health Service, with the approval of the Federal Security Administrator, is required to allot the money made available for grants for public health work on the basis of (1) the population, (2) special health problems and (3) the financial needs of the respective states. Regulations have now been issued providing for the distribution of this federal money.²

Twenty-seven and five-tenths per cent of the appropriation will be allotted in the ratio which the population of each state bears to the population of the United States as shown by the Census Bureau 1940 population census. Forty-five per cent of the appropriation will be distributed on the basis of (1) the ratio which the mean annual number of deaths in each state from pneumonia, cancer and other infectious and parasitic diseases, except influenza and syphilis, bears to the total mortality from these causes in the United States as shown by the Bureau of Census "mortality statistics" for the five years 1934-1938; (2) prevalence of malaria, hookworm disease, trachoma, typhus fever and other similar geographically limited diseases, special industrial hazards and other conditions that result in an inequality of exposure to these hazards among the states; (3) special conditions which create unequal burdens in the administration of equal public health services among the states indicated by the relative population density as shown by the Bureau of Census 1940 population census; (4) the need for regional training centers, and (5) the health needs occasioned by national defense activities, including the environments of military posts, cantonment and maneuver areas, and defense industrial areas. The remaining 27.5 per cent of the appropriation will be allotted on the basis of the financial needs of the states, determinable by the ability of the state to raise revenue expressed indirectly in terms of differences in per capita five year mean income as computed by the United States Department of Commerce for the years 1935-1939.

The total amount allotted to the states on the basis of population and on the basis of special health problems will be available for payment to the states when matched dollar for dollar by state or local public funds for public health service as follows: (a) 50 per cent by an equal amount of existing appropriations of public funds for public health services and (b) 50 per cent by an equal amount of "new appropriations of public funds for public health services made since January 1, 1935" or made prior to that date for the specific purpose of matching funds available under the Social Security Act. The Surgeon General may, in his discretion, permit not to

exceed 50 per cent of the money available for matching with new public funds to be matched with existing state appropriations for local health work when the state is already making a substantial appropriation for this purpose and may waive in whole or in part matching requirements in those states in which the per capita appropriation for state health department services, exclusive of funds for the maintenance of institutions, exceeds the average per capita appropriations of all the states for the same purposes. No funds allotted to a state from this appropriation may be used to replace state or local funds in such a way as to effect a conservation or reduction of appropriations for health work by state and local governmental agencies.

To be eligible to receive payments from allotments, each state must submit to the Surgeon General of the Public Health Service a comprehensive statement of any changes in the state health organization, programs, appropriations and budgets since the last outline of such organization, programs, appropriations and budget was filed. This statement is to include all activities maintained through local, state or federal funds under the supervision of or in cooperation with the state health department. There must be submitted also a proposed plan for extending and improving the administrative functions of the state department of health, including the administration of personnel on a merit basis. When found acceptable, the merit system shall apply to state or local personnel rendering services in accordance with budgets submitted to the Public Health Service. At the option of the state agency, however, there may be exempted from compliance with the merit system plan (1) members of state and local boards or commissions, (2) the executive head of the state agency administering the state public health program, (3) members of advisory councils or committees or similar bodies paid only for attendance at meetings, (4) state and local officials serving ex officio and performing incidental duties and (5) all part time professional persons who are paid for any form of medical, nursing or other professional service and who are not engaged in the performance of administrative duties under the state plan but who meet the standards of training and experience established by the responsible state authority. There must be submitted to the Surgeon General too a proposed plan for extending and improving county, district and city health services.

Payments to the states are also conditioned on the submission of a budget for each project, state or local, in which public health service funds are to be utilized and budgets for new projects. Various types of reports are required, periodic financial reports and progress reports of activities, including an annual report of all activities of the state health department, which may be submitted in narrative form.

In order to meet the needs for properly qualified professional and technical personnel with which to conduct effectively the state and local health services, funds paid to a state may be used to pay living stipends,

1. Public Law No. 146, 77th Congress, approved July 1, 1941.
2. Federal Register 6: 3287 (July 8) 1941.

tuition and traveling expenses for the training of personnel employed or to be employed in the state and local health services. Except when specifically authorized by the Surgeon General, the training period may not exceed one year for any one individual. Allowances for stipends for public health trainees may not exceed

the amount specified by the Surgeon General. A trainee application form provided by the Public Health Service must be completed by the proposed trainee and submitted by the state health officer with his recommendation to the district office of the Public Health Service for approval before the trainee enters on training.

MEDICAL ECONOMIC ABSTRACTS

UNITED STATES VITAL STATISTICS

A "Summary of Vital Statistics" for 1939, issued by the Bureau of the Census May 12, 1941 gives a more comprehensive view of this field than has been furnished by any previous documents. Its first paragraph summarizes the situation:

1939 was a very significant year in the health progress of the nation. The incidence of reportable communicable diseases was relatively low and mortality rates for a number of causes of death were the lowest ever recorded for the United States death registration area. The death rate for all causes was, in 1939, 10.6 per 1,000 estimated population, the lowest death rate ever reported in the history of the registration area. New record lows were also established in the infant and maternal mortality rates, and in death rates for causes such as influenza and pneumonia, tuberculosis, scarlet fever, measles, malaria, diarrhea and enteritis, typhoid and paratyphoid fever, etc. On the other hand, the 1939 death rates for heart diseases, cancers and diabetes have been the highest ever reported in the forty-year history of national vital statistics.

A separate study made by Walter F. Willcox indicates:

... that the death rates for states that were predominantly urban in population characteristics fell more rapidly during the period 1900 to 1930 than the death rates for the more rural states. Willcox suggests that the more rapid decline in the mortality rate in the urban areas was due to the greater influence of the public health movement in the cities than in the rest of the country.

The death rates for the urban industrial regions have now become more or less stabilized and are now dependent largely "on the average age of the general population, the race and economic status."

The United States is low in the rank order of death rates among the various countries of the world. Those that are below it are Denmark, Uruguay, Canada, Norway, New Zealand, Australia, Union of South Africa and the Netherlands. (Is

there any significance in the fact that of these nations Canada, New Zealand, Australia, the Union of South Africa and the Netherlands are among the few countries left that have no system of compulsory sickness insurance and that the system of Denmark is the one most closely controlled by the medical profession?)

The infant mortality has continuously decreased from 99.9 in 1915 to 48 in 1939. The most rapid period of fall was from 1920 to 1930. There are only six nations with a lower infant mortality than the United States. These are Sweden, Switzerland, Australia, Norway, the Netherlands and New Zealand. (None of these have systems of compulsory sickness insurance.)

Maternal mortality is also steadily declining at an apparently accelerated rate. (Since these figures are confined to the registration area, they are subject to the significant error that the period covered was one of rapid addition to the registration area of states generally with a higher maternal death rate and that the period from 1930 to 1939, during which there has been the most rapid decline, is one during which there were fewer additions.)

There is a wide difference in the regional death rates for puerperal causes. The average for the United States is 40.4 for 10,000 live births, but the Pacific, New England, Middle Atlantic, East and West North Central all have maternal death rates below 35. (These sections contain a population much larger than that of any nation having a lower maternal mortality, and important omissions in birth registration possibly account to some extent for the higher birth rates in other sections.)

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—H. R. 3484 has passed the House, providing retirement pay and hospital benefits to certain reserve officers of the Army disabled while on active duty. This bill provides that reserve officers of the Army who were called or ordered into the active military service by the federal government for extended military service in excess of thirty days on or subsequent to Feb. 28, 1925 other than for service with the Civilian Conservation Corps, and who are now disabled from disease or injury contracted or received in line of duty while so employed, shall be deemed to have been in the active military service during such period and shall be entitled to the same retirement pay and hospital benefits as are now or may hereafter be provided for officers of corresponding grades and length of service in the Regular Army. H. R. 4293 has passed the House and Senate, providing that any person who furnishes blood from his or her veins for transfusion in the veins of a

person entitled to and undergoing treatment at government expense or who shall furnish blood for blood banks or for other scientific and research purposes, in connection with the care of any person entitled to treatment at government expense, shall be entitled to be paid therefor, for each blood withdrawal, a sum not to exceed \$50. H. R. 4476, providing for sundry matters affecting the military establishment and containing an authorization for the employment of osteopaths as interns in army hospitals, was reached on the consent calendar of the House, June 7. Consideration of the bill was postponed by objection filed by Representative Wolcott, Michigan. H. R. 5146 has passed the House, amending an act passed in 1938 authorizing an appropriation for a new building for the Surgeon General's Library and Museum. The pending bill specifically authorizes the purchase of a site for the new building and increases the appropriation previously authorized by the sum of \$1,000,000.

WOMAN'S AUXILIARY

South Dakota

The Woman's Auxiliary to the South Dakota State Medical Association held its annual meeting in Mitchell May 18-20. The following officers were elected: president, Mrs. F. C. Nilsson, Sioux Falls; president-elect, Mrs. B. M. Hart, Onida; first vice president, Mrs. D. R. Mabey, Mitchell; second vice president, Mrs. G. E. Whitson, Madison; recording secretary,

Mrs. J. C. Hagin, Miller; corresponding secretary and treasurer, Mrs. Otto Hansen, Valley Springs. Dr. Bertrand M. Hart, president of the South Dakota State Medical Association, spoke. The auxiliary was entertained by the Mitchell auxiliary at the home of Mrs. B. A. Bobb. A banquet was held at the Masonic Temple at which Dr. Roy W. Fouts of Omaha was the speaker.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

Changes at University of Arkansas.—Dr. Byron L. Robinson, professor of anatomy, University of Arkansas School of Medicine, Little Rock, has been appointed dean of the school, succeeding Dr. Stuart P. Cromer, beginning July 1. Dr. Silas C. Fulmer, who formerly was assistant dean at the school, has again been appointed to this position. Other changes reported include the appointment of Mr. Walter J. Grolton, superintendent of the St. Louis City Hospital, St. Louis, as superintendent of the University Hospital.

University Buys Radium for Hospital.—Fifty mg. of radium has been purchased for use in the tumor clinic of the University Hospital, Little Rock, newspapers report. The radium was bought with a donation of more than \$600 to the University of Arkansas School of Medicine, Little Rock, from the Elise A. Lake Foundation, a gift of \$600 by the state hospital of nervous diseases and an additional sum from the school of medicine. The Lake foundation with this gift disposed of all the funds on hand. In the future, all donations made honoring the memory, life and service to the state of the late Elise A. Lake will be accepted by the University of Arkansas School of Medicine and will be devoted in her name wholly to the purposes of the foundation.

CALIFORNIA

Plague Infection.—Under date of May 24 Dr. Newton E. Wayson, medical officer in charge of plague suppressive measures, San Francisco, reported plague infection, proved by animal inoculation and cultures, in 298 fleas from 20 beecheyi squirrels submitted to the laboratory April 29, in 64 fleas from 11 beecheyi squirrels submitted to the laboratory April 29 and in 46 fleas from 3 beecheyi squirrels submitted to the laboratory May 14, all from the J. McKenzie Ranch, 7 miles south and 5 miles west of Tehachapi, Kern County.

Dr. Pardee Resigns.—Dr. George C. Pardee, Oakland, ex-governor of California, concluded fifty-two years of public service May 15, when he resigned as president of the board of directors of the East Bay Municipal Utility District and as a member of the Oakland Port Commission, positions he has held, respectively, since 1924 and 1927. Born in San Francisco in 1857, Dr. Pardee graduated in medicine at the University of Leipzig in 1885 and specialized in diseases of the eye and ear. In Oakland he served as a member of the board of health, 1889-1891; member of the city council, 1891-1893; mayor, 1893-1895; regent of the state university, 1899-1903. He was governor from 1903 to 1907.

DISTRICT OF COLUMBIA

Gibson Award.—The Frank E. Gibson Award, consisting of \$25 in cash and a certificate, given annually for the best scientific paper presented at a meeting of the Washington Medical and Surgical Society, was given this year to Dr. Walter O. Teichmann during the society's forty-fourth annual dinner. The guest speaker was Hon. Samuel Wilder King, delegate from Hawaii, who discussed "Hawaii and the National Defense," and guests included Dr. Carlos N. Brin, ambassador of Panama, and Aristides A. Moll, secretary of the Pan American Sanitary Bureau.

GEORGIA

Laboratory for Ophthalmologic Research.—Mr. L. F. Montgomery, Atlanta, is the donor of a research laboratory in the department of ophthalmology of Emory University School of Medicine, to be established in Grady Hospital, according to the Fulton County Medical Society *Bulletin*. While the unit will be established permanently for Grady Hospital, its facilities will be available to other physicians.

Work Begun on Academy's New Home.—Excavation for the new Academy of Medicine, Atlanta, was begun June 10. The building will house the offices of the Fulton County Medical Society, owners of the academy building, the Medical Service Bureau and the Medical Association of Georgia. It will also contain the county medical society's library and

museum, an auditorium to seat three hundred and twenty-five persons, kitchen, dining room and lounges. Present plans call for an expenditure of more than \$100,000 for the building.

Society News.—The Fulton County Medical Society was addressed, July 7, in Atlanta by Drs. Frank K. Boland Sr. on "The Treatment of Hernia" and James K. Fancher, "Calcium Metabolism." Dr. Charles W. Roberts, newly elected member of the Board of Trustees of the American Medical Association, was to discuss the recent transactions of the House of Delegates of the Association. The society was addressed in Atlanta, June 2, by Drs. William O. Martin Jr. and Joseph C. Massee on "The Correction of Crossed Eyes" and "Phonocardiography" respectively.

Personal.—Dr. John M. Walton, Atlanta, has been appointed state venereal disease control officer, according to *Georgia's Health*. He succeeds Dr. Aaron Wilson Brown. Dr. Walton had been associated with the Atlanta department of health. —Dr. John W. Oden, formerly of Milledgeville, has been appointed medical superintendent of the Georgia Training School for Mental Defectives at Gracewood. —Dr. Lovick P. Longino, Milledgeville, has been appointed superintendent of the Milledgeville State Hospital, and Dr. Edward W. Schwall, Gracewood, has been appointed clinical director.

IDAHO

Plague Infection.—Dr. Newton E. Wayson, medical officer in charge of plague suppressive measures, San Francisco, reported plague infection proved positive on laboratory examination in fleas from 22 ground squirrels shot May 14 near Parma in Canyon County, and in another lot of fleas from 13 ground squirrels shot May 14 in Payette County.

ILLINOIS

Fund for Orthopedic Literature.—The board of trustees of the Springfield Medical Library Association announces the receipt of a fund of \$500 to be used for the purchase of orthopedic literature. The fund was created by the local chapter of the American Business Club.

Medical Museum for County Society.—The Rock Island County Medical Society has announced a plan to establish a medical museum at the Augustana College museum in Denkmann Memorial Library, Rock Island. The college offered to set aside a special room in the museum, and members of the society have agreed to donate or lend old instruments for exhibit. Plans to establish a reading room for the society at the museum were also discussed at a meeting in East Moline on May 13.

Chicago

Kretschmer Memorial Fund.—The Institute of Medicine of Chicago announces the establishment of a foundation to be known as the Edwin R. Kretschmer Memorial Fund, given by Dr. and Mrs. Herman L. Kretschmer in memory of their son, who died last February. Income from the fund is to be used for research lectures on myelogenic leukemia and for research in the field of blood dyscrasia. Dr. Kretschmer is a member of the board of governors of the institute and Treasurer of the American Medical Association.

New Physical Therapy Unit at Michael Reese.—A new physical therapy building, to be known as the Alfred C. Meyer Memorial, was opened on June 15 as a memorial to the late Mr. Meyer, from 1920 to 1936 president of Michael Reese Hospital. The unit will provide facilities for the treatment of infantile paralysis and other conditions to which physical therapy is applicable. The new building adjoins the main building to the north. Its first floor comprises fifteen treatment rooms, including a gymnasium for corrective gymnastics, fever therapy rooms and a hydrotherapy section. The second floor, which is a continuation of the private room division of the main hospital, is an eighteen bed unit for the care of general patients. The new Ervill R. Silberman pool for corrective underwater gymnastics in the basement, donated by J. D. Silberman and his son Donald, will be used for the treatment of the effects of infantile paralysis, spastic paralysis, spinal injuries and arthritis. The basement also contains a brace shop, the gift of the Chicago Club for Crippled Children. Three additional floors are also being completed in conjunction with the Nelson Morris Research Institute. These contain laboratories for cardiovascular research, donated by Mrs. A. D. Nast; laboratories for pediatric research donated by Albert and Hortense Kundstadter, and additional laboratories of the Samuel Deutsch Serum Center, for serum and virus research, donated by Mrs. J. Sylvan Kaufman, Mrs. Harold Lachman and Mrs. Henry M. Lepman.

IOWA

Institute on Industrial Health.—The state department of health and the state medical society sponsored a special institute on industrial health recently for the practicing physician, the industrial physician and the industrial manager. Each series of lectures was offered in the following centers: Burlington, June 23; Cedar Rapids, June 24; Mason City, June 25; Sioux City, June 26 and Des Moines, June 27. Out of state speakers included Drs. Clarence O. Sappington, William R. Cubbins, Sumner L. S. Koch and Michael L. Mason, Chicago; Henry W. Meyerding, Rochester, Minn.; Carey P. McCord, Detroit, and Hiram Winnett Orr, Lincoln, Neb.

Society News.—Dr. Jesse Carl Painter, Dubuque, discussed "Diagnosis of Tuberculosis" before the Bremer County Medical Society in Waverly, May 26.—Dr. Diedrich J. Haines Jr., Des Moines, addressed the Greene County Medical Society in Jefferson, June 12, on diseases of the blood.—The Hardin County Medical Society was addressed, May 27, by Dr. Wilbur C. Thatcher, Fort Dodge, on abnormal labor.—Dr. Elmer L. DeGowin, Iowa City, discussed "Use and Management of the Blood and Serum Bank" before the Woodbury County Medical Society in Sioux City, June 23, and Dr. Willis M. Fowler, Iowa City, "The Indications for Transfusion."

KENTUCKY

Dr. Katz Lectures.—Dr. Louis N. Katz, Chicago, recently delivered the first Samuel D. Gross Lecture of the Phi Delta Epsilon fraternity at the University of Louisville School of Medicine. His subject was "The Mechanism of Heart Failure."

District Meetings.—The Second Councilor District of the Kentucky State Medical Association was organized at a meeting in Owensboro, June 10. Dr. Virgil E. Simpson, Louisville, addressed the new society on "The Relation of the Medical Profession to the Care of Indigent Tuberculosis Patients." Dr. E. Dargan Smith, Owensboro, was elected president and Dr. Gaihel L. Simpson, Greenville, secretary.—The sixth and seventh councilor districts held a joint meeting in Danville, May 22, with the following speakers, among others: Major William N. Lipscomb, on "Some Phases of the Selective Service"; Drs. Ellis S. Allen, "Fracture of the Femur," and James H. Pritchett, "Management of Communicable Diseases." All are of Louisville.

LOUISIANA

Changes in Health Officers.—Dr. Emmett J. Young, Arcadia, health director of Bienville Parish, has been named to a similar position in Lincoln Parish, succeeding Dr. Nelse P. Liles Jr., Bastrop, who took over the directorship of health units in Morehouse and Union parishes.—Dr. Roscoe P. Kandle, director of the bi-parish health unit composed of Winn and Grant parishes, has been appointed regional director of the northern district of public health in Louisiana, with offices located in Monroe.—Dr. John G. Norris, Farmerville, has been placed in charge of the Vernon Parish health unit.

Special Society Elections.—Newly elected officers of the Louisiana State Pediatric Society include Drs. Julian Graubarth, New Orleans, president; Wyeth B. Worley, Shreveport, vice president, and William C. Rivenbark, New Orleans, secretary-treasurer.—The Louisiana State Coroners' Association recently elected Drs. John B. Hall, Benton, president and Charles J. Barker, Thibodaux, and Robert F. DeRouen, New Iberia, vice presidents; Luther L. Ricks, Independence, was reelected secretary.—Dr. William R. Mathews, Shreveport, was elected president of the Louisiana Association of Pathologists recently, Dr. Andrew V. Friedrichs vice president and Dr. Albert E. Casey, New Orleans, secretary.

MICHIGAN

Annual Spring Clinic.—The Interne Alumni Association of Providence Hospital, Detroit, sponsored its annual spring clinic, May 15. The program included the following: Drs. Willard O. Thompson, Chicago, on "Diagnosis and Treatment of Hypogonadism"; George Crile Jr., Cleveland, "Hyperthyroidism"; Benjamin Levine, Cleveland, "Local Application of Sulfanilamide and Its Compounds in Dermatology," and Alphonse M. Schwitalla, S.J., St. Louis, "Society's Debt to the Doctor."

Society News.—Dr. James Dellinger Barney, Boston, discussed problems of renal stone before the Kalamazoo Academy of Medicine, May 20.—Dr. Bernard I. Comroe, Philadelphia, addressed the medical section of the Wayne County

Medical Society, Detroit, May 12, on "Arthritis and Allied Conditions."—Dr. Charles E. Black, Lansing, discussed "Prevention, Early Laboratory Diagnosis and Treatment of Shock" before the Shiawassee County Medical Society in Owosso, May 15.

Trudeau Medal Awarded to Dr. Alexander.—The Trudeau Medal of the National Tuberculosis Association has been awarded to Dr. John Alexander, professor of surgery, University of Michigan Medical School, Ann Arbor, and surgeon in charge of the division of thoracic surgery of the university hospital. Dr. Alexander graduated at the University of Pennsylvania School of Medicine, Philadelphia, in 1916. He is chief surgeon of the Michigan State Sanatorium and a member of editorial boards of numerous journals devoted to his specialty. In 1925 he received the Samuel D. Gross prize of the Philadelphia Academy of Surgery and in 1930 the Henry Russel award of the University of Michigan. He was president of the American Association for Thoracic Surgery in 1935 and of the Michigan Tuberculosis Association, 1938-1939. In 1932 he was chairman of the section on surgery of the Michigan State Medical Society. He is the author of "The Surgery of Pulmonary Tuberculosis," published in 1925, and of "The Collapse Therapy of Pulmonary Tuberculosis," 1937.

MINNESOTA

Personal.—Dr. Chester A. Stewart, who has accepted an appointment as professor of pediatrics at Louisiana State University School of Medicine, New Orleans, was guest of honor at a dinner given by the staff of Swedish Hospital, Minneapolis, recently.—Dr. Donald W. Pollard was recently named superintendent of the Minneapolis General Hospital; he had been acting superintendent.—Dr. Floyd M. Feldman, director of rural health, district number 3 of the state department of health with offices in Rochester, has been appointed health officer of Rochester, according to *Minnesota Medicine*. He has been serving as part time deputy city health officer since January. He succeeds Dr. Thomas B. Magath, who resigned.

MISSISSIPPI

Health Officer Twenty-Six Years.—Dr. Daniel J. Williams, Gulfport, health officer of Harrison County since the unit was first established twenty-six years ago, retired from the position, June 30, on the expiration of his term. He has been succeeded by Dr. Everett W. Ryan, Charleston, health officer of Tallahatchie County. According to newspaper reports, Dr. Williams is said to be the oldest public health service county unit director in the United States in point of continuous service.

NEW JERSEY

Dr. Overton Resigns.—Dr. Frank Overton, Trenton, has resigned as editor of the *Journal of the Medical Society of New Jersey* and Dr. Henry A. Davidson, Newark, has been appointed part time editor for a year. Dr. Overton, now 73 years old, has been editor of the New Jersey journal since 1934 and previously was editor of the *New York State Journal of Medicine*, 1924-1933.

County Society One Hundred and Twenty-Five Years Old.—The Middlesex County Medical Society celebrated its one hundred and twenty-fifth anniversary, June 11, with a dinner at the Walker-Gordon Farm near Plainsboro. Dr. William J. Carrington, Atlantic City, was toastmaster and the speakers included Drs. Joseph H. Kler, New Brunswick, on "The Position of the Middlesex County Medical Society in the History of the Medical Profession in the State of New Jersey" and Dr. Watson B. Morris, Springfield, immediate past president of the Medical Society of New Jersey.

NEW YORK

Personal.—Dr. Arthur J. Bedell, Albany, received the honorary degree of doctor of science at the annual commencement of Hobart College, Geneva, May 26, and also from the University of Colorado, Boulder, June 9.—Dr. Herbert C. Soule, Rochester, has been appointed medical director of the Hillside Children's Center, Rochester.—Mr. Willis H. Carrier, Syracuse, chairman of the board of the Carrier Corporation of Newark, N. J., recently received the first Frank P. Brown Medal from the Franklin Institute, Philadelphia, as "a pioneer in the creation and development of the science of air conditioning." The medal, awarded for the first time, is to be given for improvements in the building and allied industries.

New York City

Faculty Changes at Columbia.—Dr. Alson E. Braley, Detroit, has been appointed assistant professor of ophthalmology at Columbia University College of Physicians and Surgeons. Dr. Braley graduated from the State University of Iowa College of Medicine, Iowa City, in 1931. Dr. Reuben Ottenberg, assistant clinical professor of medicine, has been made assistant professor.

Society News.—Drs. Benjamin Jablons and Frederick M. Allen addressed the Medical Society of the County of New York, May 26, on "Renal Extract in Hypertension" and "Clinical and Experimental Hypertension" respectively.—Dr. Francis Peyton Rous addressed the New York Pathological Society, May 22, on "The Cancer Problem Now: A Roving Commentary."—Dr. Ashton Graybiel and Ross A. McFarland, Ph.D., Boston, addressed the New York Heart Association and the section of medicine of the New York Academy of Medicine, May 20, on clinical and physiologic aspects, respectively, of "The Neurocirculatory Adjustments During Flying."—Dr. Abner I. Weisman and Mr. C. W. Coates addressed the New York Endocrinological Society, May 28, on "The Frog (Xenopus) Test and a Rapid Diagnostic Test for Early Pregnancy" and Dr. George B. Dorff, "Sex and Growth Relationship in Children."

NORTH DAKOTA

Special Society Meeting.—Dr. Albert E. Spear, Dickinson, was elected president of the North Dakota Academy of Ophthalmology and Oto-Laryngology at the annual meeting in Grand Forks, May 20. Dr. Le Roy G. Smith, Mandan, was elected vice president and Dr. Frederick L. Wicks, Valley City, secretary. The guest speaker was Dr. Kinsey M. Simonton, Rochester, Minn., on "The Symptom of Dizziness: Its Significance in General Practice."

OHIO

State Conference on Nutrition.—A conference for professional persons interested in problems of nutrition in defense was to be held at Ohio State University, Columbus, June 17-19. Speakers included Conrad A. Elvehjem, Ph.D., professor of agricultural chemistry at the University of Wisconsin, Madison; Lydia J. Roberts, Ph.D., professor and chairman of the department of home economics, University of Chicago; Sybil L. Smith, A.M., Bureau of Home Economics, U. S. Department of Agriculture, Washington, D. C., and Miss Margery Vaughn, Federal Security Agency, Washington. Dr. Jonathan Forman, Columbus, represented the Ohio State Medical Association.

Society News.—Drs. Philip E. Piker and Howard D. McIntyre, Cincinnati, addressed the Academy of Medicine of Cincinnati, May 20, on "Symptoms of Alcoholism" and "Clinical Studies in Multiple Sclerosis" respectively.—Dr. Samuel E. Flook, Dayton, addressed the Montgomery County Medical Society, Dayton, May 16, on "Diagnosis of Hip Disease in Children."—Dr. Newton W. Kaiser, Toledo, addressed the Wood County Medical Society, Bowling Green, May 15, on "Common Psychoses and Their Interest to General Practitioners."—Dr. Charles F. Bowen and Lieut. Col. Howard E. Boucher, Columbus, addressed the Guernsey County Medical Society in Cambridge, May 15, on "Cancer and Colored Photography" and on the duties of medical examiners, respectively.—Dr. John D. Reichard, U. S. Public Health Service Hospital, Lexington, Ky., addressed the Cincinnati Society of Neurology and Psychiatry, May 27, on clinical neurology, presenting a motion picture.

OKLAHOMA

State Medical Election.—Dr. James D. Osborn Jr., Frederick, was chosen president-elect of the Oklahoma State Medical Association at the annual meeting in Oklahoma City, May 19-21, and Dr. Finis W. Ewing, Muskogee, was installed as president. Dr. Charles R. Rountree, Oklahoma City, was elected vice president and Dr. Lewis J. Moorman, Oklahoma City, was elected secretary. The 1942 meeting will be in Tulsa.

Society News.—Dr. Tazwell D. Rowland, Shawnee, addressed the Pottawatomie County Medical Society, Shawnee, June 21, on "Local Use of Sulfanilamide."—Donald B. McMullen, D.Sc., and Francis C. Lawler, D.Sc., Oklahoma City, addressed the Oklahoma County Medical Association in Oklahoma City, May 27, on "Incidence of Intestinal Parasites in School Children" and "Incidence of Monilia in the Gastro-intestinal Tract" respectively.

OREGON

Instruction in Social Hygiene.—The Oregon State System of Higher Education has received a bequest of \$400,000 from the late Dr. Ellis C. Brown, Portland, "to carry on the instruction and education of the boys and girls and young people of the state of Oregon in respect to what is commonly called 'social hygiene,' under the direction of the executive head of the University of Oregon. In accordance with the terms of the will, the position of director of public health and preventive medicine has been established at the University of Oregon Medical School, Portland. The director is to spend one third of his time in teaching at the university and the remainder in educational work throughout the state. Dr. Brown died on July 1, 1939.

PENNSYLVANIA

District Meetings.—The annual meeting of the Sixth Council District of the Medical Society of the State of Pennsylvania was held in Huntingdon, June 25. Dr. Wendell J. Stainsby, Danville, spoke on "Uses and Abuses of Sulfanilamide and Its Derivatives in the Treatment of Infectious Diseases" and Cloyd S. Harkins, D.D.S., Osceola Mills, "The Responsibility Dentists Must Assume on the Oral Cripple." Dr. Francis F. Borzell, Philadelphia, president of the state society, discussed "Medical Preparedness."—Dr. Charles L. Brown, Philadelphia, was the guest speaker for the scientific program of the Fourth Council District at its annual meeting, June 12, at the Shamokin Valley Country Club, between Shamokin and Sunbury. He discussed diet in treatment of chronic diseases and vitamin deficiencies. Dr. Borzell also spoke at this meeting on medical preparedness.

Philadelphia

Defense Council Meeting.—Dr. Philip D. Wilson, New York, addressed a meeting of the health, hospitals and sanitation committee of the Philadelphia Council of Defense, July 9, on "Medical War Work in England." Dr. Hubley R. Owen, director of public health of Philadelphia, is chairman of the defense council.

Lectures at Mercy Hospital.—The eighth annual series of postgraduate lectures at Mercy Hospital were presented May 19, 21 and 23. The speakers were:

Dr. Walter Estell Lee, Surgical Problems of Modern Warfare.
William A. Wolff, Ph.D., Practical Use of Transfusions.
Dr. Ferdinand Fetter, Some Medical Problems of Troop Mobilization.
Dr. William L. Martin, Treatment of Infections.
Dr. Edward A. Schumann, Indications and Technique of Elective Cesarean Section under Local Anesthesia.
Dr. Merrill H. Curtis, Washington, D. C., The Eye in Diabetes.

RHODE ISLAND

Society News.—Dr. Louis Goodman, Howard, reported a clinical and pathologic study of an outbreak of typhoid in a state mental hospital in a paper presented before the Providence Medical Association, June 2, and Dr. Eric P. Stone spoke on "Comparative End Results of Transurethral and Surgical Prostatectomies."

SOUTH CAROLINA

Pediatric Meeting.—The annual meeting of the South Carolina Pediatric Society was held in Columbia, May 16, with Dr. Thomas Campbell Goodwin, Baltimore, as the guest speaker on the effect of scurvy, lead poisoning, bismuth poisoning, phosphorus poisoning and blood dyscrasias on the skeletal system. Officers elected were Drs. Isaac H. Grimbail, Greenville, president; Lonita M. Boggs, Greenville, vice president, and Hilla Sheriff, Columbia, secretary.

Dr. McLeod Receives American Legion Award.—The South Carolina department of the American Legion awarded its distinguished service plaque for 1941 to Dr. Frank H. McLeod, who has practiced in Florence for fifty years. In 1906 he established the Florence Infirmary, which has developed into the present McLeod Infirmary of two hundred beds. Dr. McLeod graduated from the University of Tennessee College of Medicine in 1888 and went to Florence in 1891. He has held many offices in local medical societies and was president of the South Carolina Medical Association in 1916. At one time he was editor of the *Journal of the South Carolina Medical Association*. The American Legion plaque has been given each year since 1927 to a South Carolina man or woman who has rendered distinguished unselfish service to the state. The presentation was made at Myrtle Beach, June 16.

TENNESSEE

Society News.—Dr. Brien T. King, Seattle, addressed the Nashville Academy of Medicine and the Davidson County Medical Society, Nashville, May 26, on bilateral abductor cord paralysis. A symposium on peptic ulcer was presented before the Knox County Medical Society, Knoxville, June 3, by Drs. Robert P. Layman, John R. Hill and Charles F. Clayton.

Public Health Association Officers.—Dr. William H. Enneis, health officer of Knoxville, was chosen president-elect of the Tennessee Public Health Association at the annual meeting in Nashville in May and Dr. Lloyd M. Graves, Memphis, became president. Dr. John J. Lentz, Nashville, retiring president, automatically became vice president and Dr. Robert H. Hutchison, Nashville, was reelected secretary.

Regional Meeting.—The West Tennessee Medical and Surgical Association held its annual meeting in Dyersburg, recently, with Dr. Robert McCombs, Philadelphia, as the guest speaker on "Diagnosis, Prognosis and Treatment of Rheumatic Heart Disease." Other speakers included Drs. Frank Thomas Mitchell, Memphis, on "The Sulfonamides in Pediatric Practice"; John J. Shea, Memphis, "Management of Fractures of the Face," and Duncan Eve, Nashville, "Fractures." Dr. Virgil E. Massey, Huntingdon, was elected president.

TEXAS

Hospital News.—The Methodist Hospital of Dallas recently opened a new wing with a capacity of from 60 to 75 patients. New quarters for interns, library, staff lounge and game room, school rooms for nurses and a laboratory have also been added to the hospital's facilities.

Society News.—Drs. Milford O. Rouse, Dallas, and Emmette P. Goode, Greenville, addressed the Hunt-Rockwall-Rains Counties Medical Society, Greenville, June 3, on "Hypertension" and "So-Called Nervous Indigestion" respectively. Drs. Horace A. Baker, Wills Point, and Fred G. Evans, Grand Saline, addressed the Van Zandt County Medical Society, June 9, on "Thymus Enlargement and Treatment" and "Upper Respiratory Diseases, Their Diagnosis and Treatment" respectively.

VIRGINIA

New Health Officer for Richmond.—Dr. Millard C. Hanson, director of the syphilis control program in the health department of Pittsburgh, has been appointed health officer of Richmond, the first full time health officer the city has had since 1924, newspapers report. Dr. Hanson served as health officer of Mansfield and Richmond County, Ohio, and of the city of Toledo before going to Pittsburgh in 1940.

Meeting of Specialists.—Dr. Guy R. Fisher, Staunton, was named president-elect of the Virginia Society of Ophthalmology and Otolaryngology at the annual meeting in Richmond, recently, and Dr. Mortimer H. Williams, Roanoke, became president. Dr. Meade C. Edmunds, Petersburg, was elected secretary. Drs. James A. Babbitt and Edmund B. Spaeth, Philadelphia, were the guest speakers on "Geriatrics and Its Role in Otolaryngology" and "Surgical Treatment of Neurofibroma of the Orbit" respectively.

HAWAII

Medical Meeting and Election.—Dr. Alfred L. Craig, Honolulu, was elected president of the Hawaii Territorial Medical Association at the recent annual meeting and Dr. Rolla O. Brown, Honolulu, secretary. Among the speakers were:

Dr. Marion A. Blankenhorn, Cincinnati, Specific Therapy of Lobar Pneumonia; and Early Diagnosis of Gastric Malignancy.
Drs. Stewart E. Doolittle and Irvin L. Tilden, Honolulu, Rheumatic Heart Disease in Hawaii.
Lieut. Comdr. French R. Moore, Pearl Harbor, Clinical Evaluation of the Use of Sulfanilamide.
Dr. Forrest J. Pinkerton, Honolulu, Diseases of the Eye Photographically.
Dr. Rogers Lee Hill, Honolulu, Lobectomy for Bronchiectasis.

PUERTO RICO

New Division of Nutrition.—The Puerto Rico Department of Public Health has established a division of nutrition functioning under the bureau of maternal and child hygiene. The nutritionist in charge will be available for consultation with other divisions of the department and with other groups and agencies as well as with individual patients of the department's clinics. Tables showing the nutritive value of foods used in Puerto Rico are to be prepared, and low cost menus will be distributed. The nutritionist will also be available for talks before various groups and to help others prepare such talks.

GENERAL

Diploma Missing.—Dr. Homer F. Weir, Chicago, reports the theft of his diploma from the University of Illinois College of Medicine, Chicago, issued to him in 1940. Dr. Weir stated that the diploma was left in a shop on Clark Street near Fullerton Parkway and was taken from there, April 1.

Appointment to Revision Committee, U. S. Pharmacopoeia.—Mr. Joseph Rosin, vice president and chief chemist of Merck and Company, Rahway, N. J., has been appointed a member of the U. S. Pharmacopoeia Committee of Revision to succeed the late Charles B. Jordan, D.Sc., professor of pharmaceutical chemistry and dean of the School of Pharmacy, Purdue University, Lafayette, Ind. Mr. Rosin was a member of the committee during the 1930-1940 period.

Board Examination in Urology.—The American Board of Urology will hold its next meeting for the examination of candidates in Chicago in February 1942. The fifty case histories of major urologic problems must be received by the secretary of the board on or before November 1. The written examination will be given simultaneously in various cities in December. Inquiries may be addressed to the secretary, Dr. Gilbert J. Thomas, 1009 Nicollet Avenue, Minneapolis.

New Group for Clinical Research.—The American Federation for Clinical Research was organized at Atlantic City, May 5, and the following officers elected, among others: Drs. Maurice A. Schnitker, Toledo, Ohio, president; Arthur J. Merrill, Atlanta, vice president; Thomas M. Durant, 3401 North Broad Street, Philadelphia, secretary-treasurer. It was decided to hold the 1942 meeting in St. Paul, the date to be announced later.

Postgraduate Institutes in Psychiatry.—The fourth regional postgraduate institute for state mental hospitals sponsored by the American Psychiatric Association will be held at the Western State Hospital, Fort Steilacoom, Wash., September 1-13. Those interested in attending should communicate with Dr. William N. Keller, superintendent at Fort Steilacoom, or with Dr. Franklin G. Ebaugh, chairman of the committee on psychiatry in medical education, Colorado Psychopathic Hospital, Denver. The institutes are financed by the Rockefeller Foundation. The third was held at the South Carolina State Hospital, Columbia, in April.

Meeting on Psychopathology.—The thirty-first annual meeting of the American Psychopathological Association was held at Atlantic City, June 8-9. One session was devoted to military discussions with the following speakers:

Dr. George S. Sprague, White Plains, N. Y., Morale and Its Psychopathology.
F. Lyman Wells, Ph.D., Boston, The Problem of Marginal Intelligence in Military Service.
Dr. Abraham Myerson, Boston, Personality and the Neuroses in Relation to the Draft.
Dr. Sidney I. Schwab, St. Louis, War Neuroses Then and Now.
Dr. Charles Macfie Campbell, Boston, Lawrence of Arabia.
Dr. Harry M. Murdock, Towson, Md., Possible Contributions of World War II to Psychiatry: A Forecast.

Radio Programs on Nutrition.—Two radio programs dealing with nutrition are being broadcast weekly by the National Broadcasting Company. "Listen America," sponsored by the Women's National Emergency Committee, is heard at 8:30 p. m., Central Standard Time, over the Red network. It will continue through July and August. The "national farm and home hour," a program of the U. S. Department of Agriculture heard at 10:30 a. m. Central Standard Time over the Blue network of N. B. C., is presenting a series of talks on nutrition. Speakers for the next four weeks will be: Miriam Birdseye, U. S. Department of Agriculture, Washington, D. C., July 22, "Rural People Build for Better Nutrition"; Lela Booher, Ph.D., U. S. Department of Agriculture, Washington, July 29, "The Food You Eat and the Will to Do"; Helen Mitchell, Ph.D., Federal Security Agency, Washington, August 5, "Food Needs of Women," and Dr. Mitchell, August 12, "Good Nutrition Makes Life Longer and Happier."

Fatal Accidents in 1939.—The U. S. Bureau of the Census has issued a report on fatal accidents in the United States in 1939 showing a slight decrease from the preceding year. There were 92,623 deaths from accidental causes, a rate of 70.9 per hundred thousand, as compared with a rate of 72.3 in 1938. Excluding the rates for 1921 and 1922, the 1939 rate was the lowest ever recorded for the death registration area, the report said. The highest rates occurred in the Rocky Mountain and Pacific states. Nevada had the highest, 203.1 per hundred thousand and Rhode Island the lowest, 51.3. The five leading types of accidents accounted for 75 per cent of all the acci-

dental deaths. These were motor vehicle accidents, 30,468; injury by falls, 22,878; drowning, 5,450; burns, 4,831, and railway accidents (except collisions with motor vehicles), 3,394. In general, it appears that accident fatalities are relatively more frequent among older persons, 51 per cent having occurred in persons over 45 years old. Certain types of accidents are more frequent in the younger age groups, such as air transport accidents, about 85 per cent of which occurred to persons between the ages of 20 and 44. The most frequent cause of accidental death among infants in 1939 was mechanical suffocation, which caused 1,008 deaths of babies under 1 year of age. This report also includes data on the trend of accident mortality in the expanding death registration area from 1900 to 1939 and the trend and distribution of deaths from accidents during the past ten years for the individual states and for cities with populations of 100,000 or more.

Lalor Foundation Fellowships.—The board of trustees of the Lalor Foundation has announced the following fellowship awards in chemical and biochemical research for the academic year 1941-1942, among others: \$2,000 to Frederick W. Barnes Jr. to work at Columbia University under Hans T. Clarke, D.Sc., on the investigation of intermediary metabolism with the aid of isotopes; \$2,500 to A. Calvin Bratton, to continue work at Johns Hopkins University School of Medicine, Baltimore, under Dr. Eli K. Marshall Jr. on chemical aspects of chemotherapy of compounds of the sulfanilamide type (this award is for \$1,250 a year for two years, namely, 1941-1942 and 1942-1943); \$2,000 to Robert B. Carlin, to work at the University of Illinois, Urbana, under Roger Adams, Ph.D., on the determination of the structure of the alkaloid extracted from *Crotalaria spectabilis* and of analogous alkaloids from various *Senecio* species. Since the organization of the foundation in 1935 thirty awards, aggregating \$63,500, have been granted.

Special Society Elections.—Dr. Edwards A. Park, Baltimore, was chosen president of the American Pediatric Society, May 23, and Dr. Hugh McCulloch, St. Louis, was reelected secretary. —Philip Bard, Ph.D., Baltimore, was elected president of the American Physiological Society at its meeting in April; Dr. Carl J. Wiggers, Cleveland, was elected secretary. The 1942 meeting will be in Boston, April 7-11. —Officers of the American Society for Clinical Investigation include Drs. William Dock, San Francisco, president; Joseph M. Hayman Jr., Cleveland, vice president, and Eugene M. Landis, Charlottesville, Va., reelected secretary. The next annual session will be in Atlantic City. —The American Society of Biological Chemists chose the following officers recently: Rudolph J. Anderson, Ph.D., New Haven, president; Edward A. Doisy, Ph.D., St. Louis, president-elect and Arnold K. Balls, Ph.D., Washington, D. C., secretary. The next annual session will be held in Boston, April 7, 1942.

FOREIGN

Medical Aid to China.—Mobile medical units are the essential elements in the medical service operated by the Chinese Red Cross for the Chinese Army, United China Relief, New York, said in a recent report. The mobile unit plan grew out of the tactics used in the war, in which troops are scattered over a broad area, sometimes 100 miles deep. As all roads that could be used by the Japanese mechanized forces were destroyed, ambulances were useless in many areas. Dr. Robert K. S. Lim, who was professor of physiology at Peiping Union Medical College, Peking, when the war broke out, established mobile operating, nursing and preventive units. Dr. Lim has his headquarters at Kweiyang, where he has built a medical center. With only five thousand qualified physicians in all of China, Dr. Lim has been forced to use thousands of untrained persons as dressers. Seven emergency medical training centers have now been established to train these helpers in nursing and preventive medicine. About 85 per cent of Dr. Lim's medical supplies and more than 90 per cent of his ambulances and supply trucks have been supplied by overseas Chinese and donations from abroad. The American Bureau for Medical Aid to China has sent one hundred and fifty-nine ambulances and has made regular shipments of drugs and vaccines. It has provided a vaccine-producing plant for the medical center at Kweiyang and has supplied training schools with roentgen ray equipment, microscopes, a chemical laboratory, books and instruments, and has financed construction of five health centers. The bureau, through United China Relief, has begun a program of sending \$5,000 a month to support Dr. Lim's work and to supplement the contributions of the American Red Cross. Another serious need reported to United China Relief is a psychiatric hospital in West China to care for victims of bomb and shell shock.

Government Services

Examination for Junior Public Health Nurses

In addition to other government nursing positions now open, the U. S. Civil Service Commission announces examinations for the position of junior public health nurse, for which no experience is required. Public health nurses are especially needed in the parts of the country where large defense industries are located. Appointments will also be made for the Indian Field Service. The salary is \$1,800. Applications will be rated as received at the office of the commission in Washington, D. C., until further notice. Information may be obtained at any postoffice.

Navy Receives Medal for Life-Saving Devices

The Elliott-Cresson Gold Medal of the Franklin Institute of the State of Pennsylvania, Philadelphia, was recently awarded to the United States Navy for its work in the development of the "iron lung" and the submarine rescue chamber. Hon. Ralph A. Bard, Assistant Secretary of the Navy, who received the medal for the Navy, said that no one person in the Navy or any employee was directly responsible for the development of the life-saving apparatus. The medal will remain on display at the Naval Academy Museum, Annapolis, Md.

The submarine "lung," exhibited by the Navy at the recent annual session of the American Medical Association in Cleveland, is designed for individual escape from a submerged submarine. It consists of a rubber bag filled with oxygen and containing a canister of soda lime. Attached to this is a mouthpiece and a special arrangement of valves by means of which the wearer inhales oxygen from the bag and exhales through the soda lime to remove carbon dioxide. It has a vent valve at the lower edge of the bag that closes with sea pressure and opens with increased tension. This permits the excess air in the human lungs and in the bag to escape as the wearer ascends to the surface. There is a cutoff valve by which the air can be cut off when the man reaches the surface and the appliance becomes a life preserver.

The steel rescue chamber is 10 feet high with a diameter of 93 inches at the top and 60 inches at the bottom. It is open at the bottom and is fastened to a hatch on the hull of the submarine, through which the passengers enter. It will carry at least seven men under emergency conditions.

Research directed toward the development of these devices was begun in 1927. Experimental escapes have been effected with the lung, but it has not yet been used in actual rescue.

Hat Industry Cooperates in Eliminating Mercurial Compounds

Representatives of the hat industry recently approved regulations proposing to eliminate poisonous mercurial compounds from the manufacture of fur felt. These compounds have long been considered one of the most dangerous health hazards to workers exposed to mercury dust or vapor. Connecticut, where two thirds of the hat industry is located, showed an early interest in the mercury poisoning problem and has already taken steps to eliminate the hazard. In 1934 the U. S. Public Health Service made a survey of chronic mercurial poisoning in the hatters' fur-cutting industry, at the request of the Hatters' Fur Cutters Association. This study was supplemented by another study last year. Both studies showed that the complete solution of the problem depended on the substitution of nonpoisonous compounds for mercury in the processing of fur. The exposure of workers to mercury vapor usually begins with the drying and piling of the fur after it has been treated with mercury nitrate to form a firm felt. Treatment of the fur with the mercury nitrate is called "carroting" because of the carrot-yellow color of the treated skins. Following this treatment, all workers who handle the fur through its various stages of preparation until it finally is shaped into hats are exposed to mercury vapor or dust. Adequate substitutes which have been developed by industrial chemists are believed less expensive than mercury and do not require engineering and medical safeguards for workers. About 60 per cent of the fur felt industry already has eliminated mercury from the manufacturing processes. The U. S. Public Health Service studies showed that workers exposed to mercury dust or vapor developed irritability, digestive disturbances, insomnia, loss of appetite, tremor, loss of weight and sore mouth.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 29, 1941.

Medical Planning Commission

The first meeting of the Medical Planning Commission set up by the British Medical Association with the cooperation of the medical colleges and corporations to study wartime developments and their effects on the country's medical services, both present and future, has been held. In welcoming the more than sixty members present of the sixty-seven which constitute the commission, the chairman, Mr. H. S. Souttar, said that no body had ever met which so fully represented the medical practice of the country in all its varied aspects. The problems of medical service after the war would be complex and difficult, and on their solution would depend the health of the nation. The profession desired that every individual should have at his service, whatever his economic status, all necessary medical resources. The country had gone a long way toward achieving that, for the whole industrial population was included under national health insurance. There was a strong feeling that the service enjoyed by the worker should be extended to his dependents, which would mean that nearly 80 per cent of the population would be included. If, as had been suggested, the insurance income limit was raised, the figure would become 95 per cent. Moreover, there was a strong demand that a consultant and specialist service, with full hospital facilities, should be added. This could be met by establishing a whole time state medical service. This would be a complete break with the traditions of medical practice in Britain but it must be carefully examined. On the other hand, the present service might be developed. On one point they would all agree—that everything should be done to maintain the close personal relation between doctor and patient which had been characteristic of British medical practice.

Lord Dawson said that the commission should avoid trying to put up something brand new or something which aimed at too great completeness. The practice of medicine had been built up generation by generation, and it was only because medical knowledge had so far outstripped the organization of practice that it was necessary to review the subject. In trying to plan to meet the needs of modern society with all its economic difficulties and at the same time to recognize the great growth of knowledge, they should bear in mind "the inevitability of gradualness." The most important question was the regionalization of hospitals and health services. The practice of medicine in all its branches must become increasingly institutional, partly because of the growth of knowledge and the need for team work and partly because the best that medicine could provide should be made available to every citizen. Medicine was a difficult profession to plan for, because while planning the fabric they must preserve freedom of thought and initiative. It was not easy to apply collectivism to the fabric and yet maintain individualism in human relations. Another big question was the bridging of the gap between preventive and curative medicine. If these basic principles were settled first, all other things would be added to them.

The work of the commission would be carried out mainly in committees, which would have considerable freedom of action and would co-opt representatives, not of interests, but of different aspects of knowledge and experience. He liked to think of the medical profession filling its great place in the body politic. No other profession had widened in its generation to anything like the extent medicine had. The whole of the problems concerned with constructive health had become part of medical thought in relatively recent years. They were not yet fully

accepted, but it was largely because of their gradual acceptance that the commission had been formed to undertake a task of integration which he hoped would result in an even greater profession than they had the honor of serving.

The commission agreed to establish five committees, dealing respectively with general practice, special practice, public health, hospitals and the teaching hospitals, and a sixth, a coordination committee, which would integrate the reports of the others into one draft report, which would be submitted for criticism to the bodies represented and to the profession generally.

Sir D'Arcy Power

The death of Sir D'Arcy Power at the age of 85 years has removed a figure unique in the medical life of this country and well known all over the medical world. He combined surgical with literary eminence. Surgeon, medical historian, biographer, bibliographer and librarian, he spent his long life in the devoted service of the profession. The son of Henry Power, ophthalmic surgeon to St. Bartholomew's Hospital, he was derived from Irish, Dutch and Yorkshire strains. To the first has been attributed his versatility and remarkable courtesy. He was educated at Oxford, where after a distinguished career he became lecturer on physiology. In 1878 he entered St. Bartholomew's Hospital, with which he was identified for the rest of his life. He was curator of the museum from 1889 to 1901 and demonstrator of practical and operative surgery from 1901 to 1904. In 1898 he was elected assistant surgeon and in 1904 became full surgeon. His reputation was that of a good all round surgeon, at his best in an emergency operation. In 1912 he became a member of the Council of the Royal College of Surgeons, which he represented on many important bodies, such as the Imperial Cancer Research Fund, the International Historical Congress, the centenary celebrations of the Académie de médecine and the opening of the Royal Australian College of Surgeons. The office of honorary librarian was created for him at the College of Surgeons. No one else had such a knowledge of the treasures of its library or spent so much time in its precincts.

But it is as a writer that he has the most claims to remembrance. His first book was a manual for the physiologic laboratory, in which Vincent Harris collaborated. His first venture in the history of medicine, on which he became the leading authority of his day, was his edition of South's "Memorials of the Craft of Surgery." A long series of unsigned historical articles in the *British Medical Journal* followed, and many scholarly contributions, published under "Nova et Vetera," were from his pen. In 1931, on his seventy-fifth birthday, he was presented, on the initiative of the Osler Club, with a volume of his "Selected Writings," to which was appended a bibliography of his contributions to literature running to more than six thousand entries. Many of these were short "lives" of medical and other worthies in the Dictionary of National Biography. He also wrote numerous articles on historical subjects connected with medicine, especially of the sixteenth to eighteenth centuries in England. In conjunction with W. G. Spencer and G. E. Gask he revised the biographic notices of the fellows of the Royal College of Surgeons. His clinical writings also were excellent. He wrote extensively on cancer and on the surgery of the abdomen. In 1895 he published "Surgical Diseases of Children" and in 1915 a primer on "Wounds in War." He was co-author of a "Handbook of Surgical Pathology" and work on "Diseases of Joints."

No man was better known in the medical life of London or in the profession abroad. He was one of the secretaries of the National Committee of the four International Congresses of Medicine held in various capitals from 1900 to 1909. He was vice president of the 1921 London meeting of the International Society of the History of Medicine and honorary president of the Geneva meeting in 1925 and honorary president of the

International Society of Surgery meeting in 1925. In 1924 he went to America, where he was for two months visiting surgeon in chief of the Peter Bent Brigham Hospital, Boston. He was made honorary fellow of the American Surgical Association and delivered an address at Baltimore on "How the Tradition of British Surgery Came to America." No one who ever met him will forget his cheery smile and unfailing courtesy, not the courtesy of which the man of the world is master for the occasion but something which was part of his nature and was extended equally to high and to low.

BUENOS AIRES

(From Our Regular Correspondent)

May 7, 1941.

School Dispensaries

The national health department in Buenos Aires has organized a dispensary service in schools situated within the sparsely settled regions of the interior of the country. This service is intended not only for emergency cases but for the treatment of the most common diseases occurring in school children, such as trachoma, malaria, ankylostomiasis and endemic goiter. While the measures enabling this service do not solve the problem of medical aid, they make possible treatment which otherwise would not be available to those who need it. The medicine chests are not uniform but are adapted to the needs of the community. Four different units have been instituted, a standard unit and three units intended for endemic regions. All of them contain the same surgical material for emergency cases and medicaments required for internal medication, for skin diseases, for convalescent persons and for endemic fever. Every unit contains a list of the medicines and directions for their use.

The Hygiene of Milk

A national conference on the hygiene of milk is planned for this year, arranged by the division of mother and child welfare of the national health department. In the past only local needs were considered in the distribution of milk. A national policy, however, dealing with the nutrition of children seems called for. Statistics prepared by the national health department demonstrate that the quality of milk supplied plays an important part in the alimentary diseases of children. Milk insufficiency likewise was found to contribute to the mortality of children. The whole problem of the hygienic and sanitary treatment of milk intended for public consumption seems to require further study and regulation. The impending conference is to clarify the situation.

National Institute for Public Health in Lima

The National Institute for Hygiene and Public Health in Lima, Peru, has existed in its present form since February 1938, when it succeeded to the activities formerly conducted by the institute for vaccine and serum therapy, by the laboratories for tuberculosis research and by the plague service. It contains divisions of pathology, bacteriology, biochemistry in connection with the hospital for infectious diseases, of immunology and of organotherapy with divisions for vaccines, serums and the control of foreign and domestic biologic products, a division of applied chemistry and pharmaceuticals, administrative divisions and a library. The main function of the institute is research in human and animal pathology and the manufacture of biologic products. It trains the personnel and has facilities for special investigations. The director is Dr. Telémaco Battistini; its board is presided over by the minister of the department of public health.

Training in Hygiene and Social Medicine

A two year training course in hygiene and social medicine was organized by the faculty of medicine of the University of Buenos Aires and put in operation in April of this year. It is

directed by Prof. Alberto Zwanek, professor in the Institute of Hygiene and Social Medicine. The subjects for the first year are bacteriology, parasitology, physiology, physics and chemistry in their application to hygiene, statistics, the science of nutrition and public works sanitation. Those of the second year are epidemiology and prophylaxis, social economics and legislation, social hygiene and medicine and health administration. Practical work in the laboratory and in the field are part of the training, as well as practical studies connected with national and communal sanitary institutions. At the close of the two year training period a written paper is required on a subject of practical hygiene. Acceptance of this paper entitles the student to a diploma granted by the University of Buenos Aires and the title of "médico higienista."

The Institute for Radiology and Physical Therapy in Buenos Aires

The municipal Institute for Radiology and Physical Therapy, founded in 1925, is under the control of the public health department of the city, with Dr. A. Saralegui, professor of radiology and physical therapy in the faculty of medicine of Buenos Aires, as director. It has divisions of radiology, radium therapy, electrology, diathermy, light therapy, physical therapy and hydrotherapy. A sixty bed ward affords temporary hospitalization. The central portion of the structure has six stories and the wings three, thus making possible abundant light and air. The radiologic division commands eleven roentgenologic and three fluoroscopic chambers, each of which is designed for a special type of diagnosis, and no changes need be made in the position of the roentgen tubes. The roentgenologic division can accommodate one hundred persons within four hours. The division for electrodiagnosis and therapy contains fourteen rooms for the treatment of men and an equal number for the treatment of women and ten each for diathermy. Eight rooms are set aside for ultraviolet and infra-red treatments. The radiologic division possesses 2 Gm. of radium, distributed over three hundred and forty tubes and needles. An apparatus for tele-radiography is under construction. Facilities for the filing of the roentgenograms are thoroughly organized.

The forty-five physicians active at the institute meet once a month for a scientific session and publish the *Anales*, which appears every three months. Courses for physicians are given three days of the week. Two scholarships, open primarily to Pan American physicians and lasting nine months, are to be established.

Allergic Diseases in Argentina

Studies have been made by H. Walker, R. F. Carrón and H. Malvarez of the University of Córdoba on allergenic plants in Argentina which in part are not found in other countries. Some grasses are responsible for hay fever in Argentina which do not cause allergic reactions in other countries; plants of strong sensitizing properties found in other countries have little pathologic significance for Argentina. This difference in allergenic vegetation obviously affects the applicability to Argentina of tests and reactions employed in other countries. These authors discovered that certain plants, such as alfalfa and false acacia (*Robinia pseudoacacia*), have strong allergenic properties, though they were not so classified previously. Similarly, *Celtis tala* Gill and *Celtis tala* Sellowiana were found to possess a strongly sensitizing pollen somewhat similar to that of *Ambrosia* (ragweed) in North America. *Celtis tala* is encountered in large quantities in different regions of Argentina. In the districts studied by these investigators this plant was found, in a series of 70 cases, to provoke hay fever in 44 per cent and other respiratory disorders in 30 per cent.

Other investigators, including J. A. Bozzola, E. E. Baciagaluppi and L. R. Parodi, recently pointed out that the maple tree is the main cause of the seasonal disturbances found in

streets lined with maple trees. Of 2,900 persons who were questioned, 19 per cent stated that they were subject to ocular or respiratory disturbances at the time of the tree's greatest vegetative activity. The authors suggest that the trees be trimmed annually or be replaced by other trees free from allergenic effects.

NEWS FROM GERMANY

(Compiled from recent German periodicals)

Census of Venereal Diseases

The minister of the interior has ordered a census of new infections with syphilis, gonorrhea and chancroid (*Klin. Wchenschr.* 20:544 [June 1] 1940). This census is to be carried out in the following manner: The physician records from June 1 to June 30, 1940, inclusive, every case of a new infection on a postal card provided for him by the aerztckammer and containing printed forms and a reply attachment. If a physician refers a patient to another physician, the assigning physician makes the report, if he has made the diagnosis. The report card of the physician to the respective aerztckammer must be mailed on July 1, 1940. The physician who has seen no new cases of venereal diseases during the period in question is obliged to make a report to this effect. The report cards of each aerztckammer are collected by the reichs (federal) aerztckammer. The statistical and scientific evaluation of the census will be made by the reichs health office.

Harvesting of Medicinal Herbs in 1941

On February 13 the reichs minister of education (*Deutsche med. Wchenschr.* 67:472 [April 25] 1941) issued an order to the effect that in the future the Hitler youth is to collect the blossoms of linden trees, chestnuts and three different types of tea and medicinal herbs, the harvesting of which requires no special botanic knowledge. What plants are to be collected in the different parts of Germany will be determined and announced by the reichs office for economic cultivation after consultation with the youth leadership of the national socialistic party. Schools take over the collection of the crop of all other medicinal and tea herbs. The children who have been sent to camps in the country are to collect all types of medicinal and tea herbs after they have received proper instruction.

Churches and Public Hospitals

The activity of religious organizations in public hospitals, asylums and nursing homes has been regulated by an order of the reichs ministry of the interior dated April 9 (*München. med. Wchenschr.* 88:512 [April 25] 1941). New additions are as follows: In case of visits and calls of pastors of the parochial districts in which the patient lives, the pastor is to be given access to the patient only if the patient desires it. . . . Inspection of the lists of patients of a hospital in order to ascertain the religious affiliation of the patients is not permitted. With the exception of emergency baptism, baptismal acts should not be performed in hospitals.

Prescription Required for Sex Hormones

On March 13 the reichs secretary of the interior (*Deutsche med. Wchenschr.* 67:446 [April 18] 1941) issued a decree according to which substances with the action of female sex hormones, quinine preparations and other groups of medicines can be dispensed only on physician's prescription and by approved drug stores. The substances include female sex hormones (estrogenic hormone, corpus luteum hormone), vegetable products as well as synthetic and half synthetic substances that exert the action of the female sex hormones. Quinine and its compounds can be dispensed in the drug stores only on presentation of prescriptions bearing the date, directions for administration and signature of a physician, dental physician or veterinary—in the last instance only for use in animals.

Exempted from this regulation are preparations of female sex hormones that are to be fed to poultry, preparations for external application and preparations for internal use when the customary single dose does not contain more than 0.05 Gm. of quinine base—in case of compound medicaments not more than 0.1 Gm. of quinine base—and if this is indicated on the label. A term of six months is granted to comply with this labeling.

Substances and preparations which are intended for introduction into the vagina to counteract amenorrhea, even if they are designated as remedies for menstrual disturbances, can be dispensed by the drug stores for use by human subjects only on presentation of a prescription bearing date, directions for application and signature of a physician.

The repeated sale of the aforementioned products is permitted only if repetition is approved in the prescription and if it is indicated how often and to what date renewal is permissible.

Institute for Industrial Medicine

The minister of economics of the state of Württemberg (*München. med. Wchenschr.* 88:436 [April 11] 1941) authorized the state medical officer for occupational diseases, Dr. Karl Humperdinck, to enlarge the former laboratory and testing station for industrial medicine to an institute for industrial medicine of the state of Württemberg. The knowledge of the influence of occupations on the health is to be increased. Dr. Humperdinck is also director of the section "Healthy Work Arrangement" in the district office of the German Work Front "Health and the Protection of the People."

Sale of Mineral Waters

The reichs commissioner for price control (*Klin. Wchenschr.* 20:672 [June 29] 1940) has ordered a new uniform price fixation for more than a hundred German mineral waters. Hereafter, mineral waters will no longer be sold in taverns but only in drug stores and in stores specializing in mineral waters. Drug stores furnish information about names, action and prices of the mineral waters.

The Friedmann Tuberculosis Remedy

The Friedmann remedy has been rejected after decades of careful investigation by experienced specialists in tuberculosis (*München. med. Wchenschr.* 88:512 [April 25] 1941). In the "Friedmann law suit" the worthlessness has been corroborated on the basis of detailed reports of qualified experts. The followers of Friedmann now use the old Friedmann remedy again under the new name of "utilin." The board of directors and the advisers of the German Tuberculosis Society unanimously reject the application of "utilin."

Committee to Supervise Vitamins in Sweden

In Stockholm (*Deutsche med. Wchenschr.* 67:446 [April 18] 1941) a committee has been selected to supervise the systematic provision of the country with vitamins. This committee includes the director of the medical board, General Director Höjer, the director of the institute for the people's health, Prof. Ernst Abramson, an inspector of the government bureau of foods and Prof. Nils Hellström of the Industrial Commission.

Marriages

CHARLES A. WILLIS, Bainbridge, Ga., to Miss Jule Wilson in Montgomery, Ala., in April.

CARL WILLIAM KOEPFER, Oakland, Calif., to Miss Ruth Walters of Americus, Ga., recently.

HARRY M. DICKMAN, Detroit, to Miss Dorothy Mac Houser of Jackson, Mich., March 27.

HARRY H. FARR, Newark, N. J., to Miss Florence Kaufman of Waterbury, Conn., June 29.

Deaths

Gilbert E. Seaman * Madison, Wis.; Michigan College of Medicine and Surgery, Detroit, 1889; director, division of mental hygiene, state department of public welfare; member of the American Psychiatric Association; fellow of the American College of Surgeons; past president of the Association of Military Surgeons of the United States; delegate to the fourth International Congress of Military Medicine in Warsaw in 1927 and London in 1929; veteran of the Spanish-American and World wars; was awarded the Distinguished Service Medal, and the Legion of Honor of France; for many years surgeon general of the Wisconsin National Guard; member of the state board of education; a regent of the University of Wisconsin from 1911 to 1925, vice president from June 1919 to June 1920 and president from June 1920 to June 1921; at one time clinical professor of ophthalmology at the Wisconsin College of Physicians and Surgeons, Milwaukee; at various times medical superintendent of the Winnebago State Hospital and clinical director of the Shorewood Hospital-Sanitarium, Milwaukee; author of "Compendium for Medical Officers"; aged 71; died, May 25, at his home at Oconomowoc Lake of coronary occlusion.

John Ross Neal * Chicago; Northwestern University Medical School, Chicago, 1909; secretary of the Illinois Professional Committee for Medicine, Department of Registration and Education; past president of the Federation of State Medical Boards of the United States, and the Illinois State Medical Society; served during the World War; medical director of the Alliance Life Insurance Company, Peoria, Ill.; dean of the Cook County Graduate School of Medicine; aged 61; died, July 1, in Grant Hospital of coronary thrombosis.

Leo Aloysius McClusky, Syracuse, N. Y.; Syracuse University College of Medicine, 1924; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; instructor of gynecology at his alma mater; attending gynecologist, General Hospital; assistant gynecologist, St. Joseph Hospital and the City Hospital; aged 40; died, May 1, of injuries received in an automobile accident.

Merle Edison Scott, Massillon, Ohio; Ohio State University College of Medicine, Columbus, 1920; member of the Ohio State Medical Association and the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; past president of the Stark County Medical Society; on the staff of the Massillon City Hospital; aged 51; died, May 20, of a self-inflicted bullet wound.

Eugene Smith Jr., Detroit; Detroit College of Medicine, 1912; member of the Michigan State Medical Society; for many years medical examiner for the Civil Service Commission; formerly surgeon for the police department; served during the World War; on the staffs of the Woman's Hospital and St. Mary's Hospital; aged 53; died, May 20, in the Harper Hospital of cirrhosis of the liver.

Halsey Jay Ball, Cape May, N. J.; New York Homeopathic Medical College and Hospital, New York, 1890; member of the Medical Society of the State of New York; for many years associated with the New York State Health Department as health officer of various towns and district health officer; retired Sept. 1, 1938, having reached retirement age; aged 72; died May 31.

Mack Voorhees Stone * Assistant Surgeon, Lieutenant (j. g.) United States Navy, retired, Healdsburg, Calif.; University of California Medical Department, San Francisco, 1896; entered the navy Nov. 28, 1900 and retired Jan. 26, 1904 for incapacity resulting from an incident of the service; aged 65; died, May 14, of carcinoma of the liver.

Henry Frederick Rohrs, Napoleon, Ohio; Jefferson Medical College of Philadelphia, 1895; member of the Ohio State Medical Association; served during the World War; for many years member of the board of education; on the staff of the S. M. Heller Memorial Hospital; aged 67; died, May 17, of carcinoma of the stomach.

George Henry Reichers * Brooklyn; Columbia University College of Physicians and Surgeons, New York, 1900; fellow of the American College of Surgeons; served during the World War; surgical director, Bushwick Hospital; consulting surgeon, Lutheran Hospital; aged 62; died, April 30, of coronary thrombosis.

M. Edward Headland, Butler, Pa.; Starling Medical College, Columbus, Ohio, 1889; member of the Medical Society

of the State of Pennsylvania; county coroner; for many years physician for the board of health and at one time member of the school board; aged 78; died, May 20, of carcinoma of the intestine.

Hubert Henry Fletcher, McAllen, Texas; Barnes Medical College, St. Louis, 1899 and 1901; member of the State Medical Association of Texas; served during the World War; at one time mayor of Winchester, Ill.; at one time superintendent of the Illinois Soldiers and Sailors Home, Quincy, Ill.; aged 68; died, May 11.

William Freeman Rich, Pueblo, Colo.; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; member of the Colorado State Medical Society; on the staffs of St. Mary Hospital and the Corwin Hospital; aged 66; died, May 14, in the Woodcroft Hospital of lethargic encephalitis.

Gardner A. Huntoon * Des Moines, Iowa; State University of Iowa College of Homeopathic Medicine, Iowa City, 1896; member of the state board of health from 1911 to 1913; on the staff of the Iowa Lutheran Hospital; aged 66; died, May 30, of coronary occlusion.

Hubert J. Phillips, Bear Lake, Pa.; National Normal University College of Medicine, Lebanon, Ohio, 1893; National Medical College, Chicago, 1896; member of the Medical Society of the State of Pennsylvania; aged 75; died, May 15, of arteriosclerosis and diabetes mellitus.

William Kaull Jacoby, Evanston, Wyo.; St. Louis University School of Medicine, 1906; member of the Wyoming State Medical Society; owner of a hospital bearing his name; aged 61; died, May 6, of injuries received in an automobile accident near Jackson.

Lamora Shuey, Toledo, Ohio; Toledo Medical College, 1898; member of the Ohio State Medical Association; for many years on the staff of the Robinwood Hospital; aged 78; died, May 25, of empyema of the gallbladder with gallstones and acute pancreatitis.

Joseph Michael O'Malley, Ohio, Ill.; St. Louis University School of Medicine, 1907; member of the Illinois State Medical Society; president of the board of education; aged 65; died, May 23, when the automobile in which he was driving was struck by a truck.

James Henry Walsh * Fall River, Mass.; College of Physicians and Surgeons, Baltimore, 1910; for many years bacteriologist for the city board of health; on the staff of the Newport Hospital; aged 56; died, May 14, of heart disease and hypertension.

George W. McCarthy, Kenosha, Wis.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1901; member of the State Medical Society of Wisconsin; on the staffs of St. Catherine's and Kenosha hospitals; aged 71; died, May 22, of myocarditis.

Joseph L. Leopold, Grand Cane, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1891; member of the Louisiana State Medical Society; aged 76; died, May 21, in a hospital at Shreveport of shock following a prostatectomy.

Alfred Maull Elwell, Camden, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1899; member of the Medical Society of New Jersey; on the staff of the Cooper Hospital; aged 64; died, May 24, in Ocean City of myocarditis.

George Lucian Bates * Morrisville, Vt.; University of Vermont College of Medicine, Burlington, 1897; served during the World War; aged 69; formerly president of the staff of the Copley Hospital, where he died, May 21, of cerebral hemorrhage.

William Franklin Cross, Miami, Fla.; Atlanta (Ga.) School of Medicine, 1912; veteran of the Spanish-American and World wars; aged 61; died, May 21, in the Jackson Memorial Hospital of peritonitis following an operation for peptic ulcer.

Delbert Arthur Welles * Fitchburg, Mass.; Columbian University Medical Department, Washington, D. C., 1898; member of the city council; aged 76; died, May 1, in the Burbank Hospital of coronary thrombosis and cerebral sclerosis.

Howard Russell Sword * Milledgeville, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; formerly member of the board of health; aged 60; died, May 21, of cerebral hemorrhage.

William Joseph Daly, Brookline, Mass.; Harvard Medical School, Boston, 1895; served in various capacities on the staffs of the Boston City Hospital and the Massachusetts Eye and Ear Infirmary, Boston; aged 67; died, May 17.

Frederick John Hund, Freestone, Calif.; University of the City of New York Medical Department, 1879; aged 82; died, May 20, in St. Francis Hospital, San Francisco, of hypostatic pneumonia and carcinoma of the cecum.

Edwin Augustus Moore, Harlan, Iowa; John A. Creighton Medical College, Omaha, 1901; member of the Iowa State Medical Society; formerly member of the state legislature; aged 68; died, May 25, of chronic myocarditis.

James Edwin Jones, Hollis, Okla.; Kansas City (Mo.) Medical College, 1891; member of the Oklahoma State Medical Association; formerly health superintendent of Harmon County; aged 76; died, May 23, of coronary disease.

Clarence Wesley Tunison, Cincinnati; Medical Department of the University of Cincinnati, 1912; member of the Ohio State Medical Association; aged 53; died, May 23, of injuries received in an automobile accident.

William Tell Oppenhimer Jr., Richmond, Va.; Medical College of Virginia, Richmond, 1917; member of the Medical Society of Virginia; served during the World War; aged 49; died, May 20, in Radford in an accident.

Benjamin J. McGoogan, Morven, N. C.; University of Maryland School of Medicine, Baltimore, 1912; member of the Medical Society of the State of North Carolina; aged 52; died, May 22, of coronary occlusion.

Nathaniel C. Peters, Northampton, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1888; member of the Medical Society of the State of Pennsylvania; aged 80; died, May 12, of senility.

Edward Daniel Osborne, New Bedford, Mass.; Howard University College of Medicine, Washington, D. C., 1907; member of the Massachusetts Medical Society; aged 64; died, May 18, of coronary thrombosis.

Morse Harrod, Fort Wayne, Ind.; Eclectic Medical Institute, Cincinnati, 1891; member of the Indiana State Medical Association; on the staff of St. Joseph's Hospital; aged 75; died, May 15, of erysipelas.

John Joseph Heck, Baltimore; College of Physicians and Surgeons, Baltimore, 1903; member of the Medical and Surgical Faculty of Maryland; aged 61; died, May 4, of arteriosclerosis and heart disease.

John Frank Sargent, Oklahoma City; University of Oklahoma School of Medicine, Oklahoma City, 1921; member of the Oklahoma State Medical Association; aged 47; died, May 4, in the Wesley Hospital.

Thomas Eugene Puthoff, San Francisco; Stanford University School of Medicine, San Francisco, 1935; member of the California Medical Association; aged 31; died, May 15, of a self-inflicted bullet wound.

Seth Wade Huffman, McKenzie, Tenn.; University of Tennessee Medical Department, Nashville, 1906; member of the Tennessee State Medical Association; aged 68; died, May 21, of cardiovascular disease.

Robert G. Fallis, Louisville, Ky.; University of Louisville Medical Department, 1883; Hospital College of Medicine, Louisville, 1895; aged 78; died, May 12, in the Deaconess Hospital of mesenteric thrombosis.

Brett Davis, Los Gatos, Calif.; University of Kansas School of Medicine, Kansas City, 1909; member of the California Medical Association; served during the World War; aged 56; died, May 12.

Lynn Lewis Myers, Sheldon, Iowa; State University of Iowa College of Medicine, Iowa City, 1916; on the staff of the Sheldon Good Samaritan Hospital; aged 47; died, April 27, of arteriosclerosis.

Charles Nelson Race, Flint, Mich.; Detroit College of Medicine and Surgery, 1914; for many years coroner of Tuscola County, Mich.; aged 51; died, May 16, in the Hurley Hospital of coronary occlusion.

Louis Adelbert Ling @ Deer Park, Wash.; State University of Iowa College of Medicine, Iowa City, 1934; captain in the medical reserve corps of the United States Army; aged 30; died, May 17.

Jesse Brenton Coppens, Chicago; Loyola University School of Medicine, Chicago, 1917; on the staff of the Martha Washington Hospital; aged 58; died, May 26, of chronic myocarditis.

Edwin Irving Ives @ Little Falls, N. J.; University and Bellevue Hospital Medical College, New York, 1908; health officer of Little Falls; aged 55; died, May 20, of coronary thrombosis.

Arthur Newlin @ Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1899; served during the World War; aged 66; died, April 13, of coronary thrombosis.

Theodore Adolphus Saupter, Toledo, Ohio; Toledo Medical College, 1912; aged 74; died, May 14, in the Mercy Hospital of a skull fracture received when he was struck by an automobile.

Helen Delucia Fisk Hoffman, Canandaigua, N. Y.; Eclectic Medical College of the City of New York, 1882; aged 92; died, May 16, in the Canandaigua Health Home of pneumonia.

William Beach Hewett, St. Petersburg, Fla.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1877; aged 89; died, May 14, of coronary occlusion.

John H. Jones, Seymour, Ind.; Eclectic Medical Institute, Cincinnati, 1891; aged 80; died, May 14, in the Schneck Hospital of complications resulting from a fractured hip received in a fall.

John Lawrence Sheils, New York; Columbia University College of Physicians and Surgeons, New York, 1896; aged 68; died, May 23, of uremia and fracture of the left femur due to a fall.

Albert S. Corbin, Tennessee City, Tenn.; American Eclectic Medical College, Cincinnati, 1890; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1891; aged 79; died, May 30.

Stephan Seborn Jones, Calico Rock, Ark. (licensed in Arkansas in 1903); member of the Arkansas Medical Society; aged 69; died, May 7, in a hospital at Batesville of coronary disease.

Eugene Trustrum Hurd, Auburn, Calif. (licensed in Washington in 1916); served with the Russian Army during the World War; aged 59; died, May 19, in Richardson Springs.

Joseph Hannibal Howard, Chicago; Meharry Medical College, Nashville, Tenn., 1904; on the staff of the Provident Hospital; aged 62; died, May 12, of cerebral hemorrhage.

Jesse A. Jamison, Fairmont, W. Va.; College of Physicians and Surgeons, Baltimore, 1884; formerly city health officer; aged 81; died, May 26, of coronary heart disease.

John William Harrah, Minneapolis; Fort Wayne (Ind.) College of Medicine, 1879; aged 89; died, May 23, in the Abbott Hospital of a fractured hip received in a fall.

Charles F. Daubenspeck, Butler, Pa.; Western Reserve University Medical Department, Cleveland, 1877; aged 91; died, May 16, of chronic myocarditis and endocarditis.

James Henry Johnson @ Columbus, Ga.; Southern Medical College, Atlanta, 1891; on the staff of the City Hospital; aged 75; died, May 11, of coronary thrombosis.

John Cicero Hughes @ Hoxie, Ark.; Memphis (Tenn.) Hospital Medical College, 1903; served during the World War; aged 65; died, May 13, of angina pectoris.

Edward William Mulligan, Tucson, Ariz.; George Washington University School of Medicine, Washington, D. C., 1917; aged 48; hanged himself, May 12.

M. Alice Kirk Roehrig Ryan Heney, Hastings, Mich.; University of Wooster Medical Department, Cleveland, 1892; aged 74; died, June 7, in Richland.

Edward Wilson Sickel @ Baltimore; Johns Hopkins University School of Medicine, Baltimore, 1923; aged 42; died, May 19, of chronic nephritis.

Alfred Camille DuPont, New York; University of the City of New York Medical Department, 1895; aged 73; died, May 30, of pneumonia.

Eber Eldon Haggerty, La Farge, Wis.; Milwaukee Medical College, 1898; served during the World War; aged 69; died, May 12.

Alice Florence Piper Rud, Chicago; Woman's Medical College, Chicago, 1889; aged 76; died, May 23, of myocarditis and nephritis.

John Hutchinson, New York; New York Homoeopathic Medical College and Hospital, New York, 1898; aged 81; died, May 29.

Ernest W. Oelfcken, St. Louis; Missouri Medical College, St. Louis, 1896; aged 70; died, May 12, in the Central Hospital.

Correspondence

CANADIAN COMMISSION DENIES AUTHORIZATION FOR CIRCULAR ON KOCH TREATMENT FOR CANCER

To the Editor:—Apparently a circular letter has been widely distributed among members of the medical profession in the United States, indicating that this commission has compiled a series of proofs of the efficacy of the Koch treatment of cancer.

A sponsor of the Koch treatment appeared before this commission and submitted some evidence, in the main consisting of case histories. To correct any erroneous inference that might be drawn from the circular mentioned, it should be noted that this commission has made no report expressing any opinion whatever of the efficacy or otherwise of the treatment as a remedy or cure for cancer.

J. G. GILLANDERS, Toronto.

Chairman, Commission in the Investigation of Cancer Remedies.

ABORTION

To the Editor:—An article in the June 21 issue of *THE JOURNAL* (Bush, W. L.: Tetanus Following Induced Abortion) high lights one of the great evils which should be attacked vigorously and specifically by the American Medical Association. I refer to the prevalence of abortionists and the *laissez-faire* attitude of the ethical members of our profession toward them. Five (or possibly seven) maternal deaths due to illegal abortions performed by one man in two weeks is indeed fortunately rare, but many times that number of fetal deaths and of potential maternal deaths are routine with numerous men whose existence in the community and even in the medical profession is tacitly condoned by the more respectable members of the latter. In the aggregate, the seriousness of this condition becomes apparent when one notes that 25 per cent of all maternal deaths occur in the first trimester of pregnancy and that most of them are due to sepsis.

When I was carrying on my study of abortion cases at Bellevue Hospital, New York (*Am. J. Obst. & Gynec.* 39: 919 [June] 1940; 41:61 [Jan.], 285 [Feb.] 1941; *Human Fertil.* 6:37 [April] 1941), I received the impression, exaggerated of course, that I was the only physician and almost the only adult woman in the city who did not know the name and address of at least one so-called good abortionist. I could have learned of half a dozen simply by asking, had I not expressly wished to remain in ignorance.

While recoiling in horror from the idea of performing an illegal abortion themselves, few of my colleagues would refuse to supply the name and address of one of these abortionists to a patient who applied to them in distress. The excuse they gave was that the woman was determined to be rid of the fetus and, if not directed to a clean and skilful abortionist, would either injure herself by attempts at self induction or fall into the hands of a dirty bungler. This reasoning, while often true in the individual case, has been given more weight than it deserves and has led collectively to a flourishing and ever increasing illicit traffic. The public has come to look on abortion as an easy way out of a common dilemma. Many women believe it is a safe minor operation if performed by a physician. Some seem to have no more feeling about it than about having a tooth pulled. A number told me that they

would rather take a chance and have an abortion, "if necessary," than bother with birth control. All this, of course, is indicative of a wrong headed attitude on the part of the public, but it has been fostered, howbeit unintentionally, by the easy going refusal to face the issues squarely which is the sin of omission of the most reputable of our profession.

While it is true that many women are "hell bent" on abortion and will take the most desperate chances in their efforts to procure it, the majority would be stayed by the mere inaccessibility of an abortionist. Every physician has known cases of women who frantically reject the idea of pregnancy at the time of the first missed period but who, having carried until the fourth or fifth month, reverse their attitude and settle down placidly to become good and happy mothers. This is true not only of married women who have rather superficial reasons for avoidance of additions to the family but also of others whose social or economic status might seem to make the birth of a child catastrophic.

This question should be brought out in the open. The lay and professional public should be educated as in the case of the recently unmentionable venereal diseases. The indications for therapeutic abortion should be clarified and it should be available (after due consultation and in a reputable hospital) to all women who present the bona fide indications agreed on. At the same time, those who perform illicit operations should be whole heartedly purged from our ranks and punished to the extent of the law. If these measures were carried out I believe the same brilliant results could be expected as are now being seen in the campaign against syphilis.

The prosecution of illicit practitioners cannot succeed without the vigorous support of the public. We hear frequently the fatalistic remark "You can't get a jury to convict them." On the other hand, education of the public can succeed in decreasing resort to abortionists but slowly as long as the services of these dangerous renegades are readily available to any woman who thinks she needs them. The difficulty of breaking this vicious circle is no excuse for the apathy with which it is regarded by those who deplore it. A beginning should be made by at least airing the problem.

VIRGINIA CLAY HAMILTON, M.D., Bath, Maine.

PATERNITY TESTS BY BLOOD GROUPING

To the Editor:—In the Report of the Committee on Medical-legal Blood Grouping Tests, recommendation was made that the use of blood grouping tests for the exclusion of paternity be accepted by the courts throughout this country. It was pointed out, however, that it is essential that the person performing the tests should be properly qualified, as the tests are of a highly specialized nature.

Unfortunately this warning has not been followed, and a number of blunders have resulted in addition to those mentioned in the report of the committee. Aside from the mistakes made by totally unqualified persons who presumed to undertake the examinations, errors have been made by four physicians who are outstanding in their own chosen fields. It seems trite to remark that a person who is experienced in one field does not qualify to perform work in a field in which he has no experience. In New York City the Court of Special Sessions requested the Academy of Medicine to provide a list of physicians qualified to perform blood grouping tests in paternity cases. The procedure followed by the medical society was to send circular letters to all pathologists inquiring whether or not

they felt that they could perform the tests, and all those who replied in the affirmative were included in the list. How fallacious this procedure was has been proved by the blunders made by the four physicians mentioned. It has been suggested that, to prepare a list of real experts in blood grouping, the following qualifications be required of them: (1) That the expert has published an outstanding contribution to the subject or studied with a recognized authority in the field; (2) that he submit to a practical examination in which he is required to type a series of blood samples for A-B, M-N and the subgroups, and that he test these bloods without making a single error, and (3) that the expert prepare his own reagents, including the anti-M and anti-N testing fluids. The last qualification is particularly important, because only those actively engaged in the field will prepare their own reagents, and it is the ones only casually interested in the subject and who make only occasional tests who make the errors. It is a necessary part of the test to check the reagents against standard blood samples to insure that they are of suitable potency. If the serums are not sufficiently potent or are improperly labeled, this will be revealed by the control test, and such serums must be discarded. It may be remarked that doctors posing as experts in blood grouping must assume full responsibility for their reports, and the fact that they obtained their serums from a commercial house and the serum proved to be weak does not absolve them of any of the blame should a mistake result.

ALEXANDER S. WIENER, M.D., Brooklyn.

THE ELECTRON MICROSCOPE IN SPERMATOZOAL VISUALIZATION

To the Editor:—Seymour and Benmosche reported in *THE JOURNAL* (May 31, p. 2489) the use of the electron microscope in studying and photographing the spermatozoon. While I do not wish to detract from this contribution in photographing a spermatozoon at a magnification of 27,000 diameters, some comment is evoked by the conclusions which these authors have drawn.

Seymour and Benmosche photographed one or two sperms from a single specimen and on this basis describe the shape of the heads of spermatozoa to be "pear shaped." Although it is accepted by spermatologists that pear-shaped (pyriform) sperm heads are present among the normal sperms to the extent of only 4 to 9 per cent, it seems that Seymour and Benmosche were unaware of this and instead have utilized a pear-shaped head and set it up as a normal standard.

These authors also claim to have found, among other things, a "crater-like notch" on the "vertex" of the sperm head, which they suggest to be a "suction apparatus" and which they intimate may be the means of spermatozoal attachment to the ovum.

Seymour and Benmosche further claim that ordinary microscopic visualization of sperm cells yields little information. With proper staining technique and with the oil immersion lens of the ordinary microscope I have been able to visualize much more of the structure of the sperm than I was able to discern from the reproduction of the electron photographs which they published.

It would be desirable for other workers to make additional studies with the electron microscope under varying conditions, using more than one semen specimen from different individuals, before any changes in the concept of the spermatozoon and before any new biologic function of the sperm head should be accepted.

ABNER I. WEISMAN, M.D.

Department of Obstetrics and Gynecology of
the Metropolitan Hospital, New York.

THE USE OF SURFACE ANESTHESIA IN THE TREATMENT OF PAINFUL MOTION

To the Editor:—Kraus's article "The Use of Surface Anesthesia in the Treatment of Painful Motion" (*THE JOURNAL*, June 7, p. 2582) presents another aspect in the treatment of pain in the soft tissues.

It is unfortunate that he has not read widely on the use of injections of procaine hydrochloride; American and English workers have gone far beyond Leriche's original work. A patient with a sprained ankle can be quickly relieved by having 10 to 20 cc. of a 1 per cent solution of procaine hydrochloride injected into the torn ligaments and returned to work or sport.

The injection treatment does have the disadvantage of a needle prick; it has all the advantages of specificity. It directly relieves the painful point which causes the pain (see Sir Thomas Lewis and Kellgren's work on skin, fascia and muscle pain). Anesthetization of the skin alone is not adequate as I have tried to use it either with local applications or with infiltration of the skin with procaine hydrochloride. The latter procedure does partially relieve the sharp pain but has no effect on the dull aching of muscle pain.

In a series which is now reaching 500 injections of procaine, nupercain-ciba and eucupine, I have not had one case of infection.

As procaine hydrochloride and the barbiturates are antagonists, the use of a moderate size dose of pentobarbital sodium prevents any rare procaine after-effect. As far as procaine sensitivity goes, study at the Mayo Clinic shows that only 1 person in 20,000 is truly allergic, and such persons can be identified by the red wheal which appears on injection of procaine hydrochloride. A few months ago I repaired a perforated ulcer under local anesthesia, using 125 cc. of 0.5 per cent solution of procaine hydrochloride on a patient who "could not take novocain."

Many workers in the field of pain (Hartung, Steinbrocker, Steel, Charterhouse Rheumatism Clinic) can tell of thousands of injections with definitely beneficial results.

R. L. GORRELL, M.D., Clarion, Iowa.

To the Editor:—In *THE JOURNAL*, June 7, page 2582, Hans Kraus in his paper on "The Use of Surface Anesthesia in the Treatment of Painful Motion" states: "Empirically . . . cutaneous anesthesia . . . relieves the deep-seated pain in muscular spasm. I have no explanation to offer as to how this deep effect of surface anesthesia works. It seems to be a fact, but the underlying physiologic explanation represents an interesting field for exploration."

As to the explanation of the effect of surface anesthesia on pain, I would call attention to my article "Dependence of Sensation of Pain on Cutaneous Impulses" (*Arch. Neurol. & Psychiat.* 40:743 [Oct.] 1938) in which I concluded: "Anesthetization of localized areas of hyperalgesia and hyperesthesia in the skin relieves pain arising from deeper structures, whether visceral or skeletal. . . . Pain from skeletal or visceral tissues is referred to the skin and may be explained by a modification of Mackenzie's theory of visceral pain: An irritable focus in the central nervous system develops when it is bombarded with stimuli from an inflamed visceral or skeletal structure, which lowers the threshold for afferent impulses from the ectoderm entering the system at the level of that focus."

The observations of Hans Kraus on skeletal pains are in accord with my theory regarding the mechanism of the sensation of pain.

EDWARD HOLLANDER, M.D., New York.

EXAMINATION AND LICENSURE

Medical Examinations and Licensure

JOUR. A. M. A.
JULY 19, 1941

COMING EXAMINATIONS

NATIONAL BOARD OF MEDICAL EXAMINERS
EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, July 12, page 137.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 16-18. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARKANSAS: * Medical. Little Rock, Nov. 6-7. Sec., Dr. D. L. Owens, 1415 Main St., Little Rock.

CALIFORNIA: Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, Oct. 1. IPritcu. Sacramento, Oct. 20-23. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

CONNECTICUT: * Endorsement. Hartford, July 22. Sec., Dr. Creighton Barker, 258 Church St., New Haven.

GEORGIA: Atlanta, Oct. 14-15. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, Oct. 7. Dir., Bureau of Occupational License, Mr. Walter Curtis, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Oct. 14-16. Supt. of Registration, Mr. Lucien A. File, Department of Registration and Education, Springfield.

KANSAS: Topeka, Sept. 23-24. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

MARYLAND: Medical. Baltimore, Dec. 9-12. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore.

MICHIGAN: * Lansing, Oct. 15-17. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 203 Hollister Bldg., Lansing.

MINNESOTA: * Minneapolis, Oct. 21-23. Sec., Dr. J. F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSISSIPPI: Reciprocity. Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: Helena, Oct. 6-8. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEVADA: Reciprocity with oral examination, Aug. 4. Sec., Dr. Fred M. Anderson, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, Sept. 11-12. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, Oct. 21-22. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 13-14. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

VERMONT: Burlington, Feb. 10-12. Sec., Board of Medical Registration, Dr. F. J. Lawliss, Richford.

WASHINGTON: * Seattle, July 21-23. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

WISCONSIN: * Madison, Jan. 13-15. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, Oct. 6-7. Sec., Dr. M. C. Keith, State Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, Sept. 10-11. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

DISTRICT OF COLUMBIA: Washington, Oct. 20-21. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

MINNESOTA: Minneapolis, Oct. 7-8. Sec., Dr. J. C. McKinley, 126 Millard Hall, Minneapolis.

NEBRASKA: * Lincoln, Oct. 7-8. Dir., Bureau of Examining Boards, Mrs. Jeannette Crawford, 1009 State Capitol Bldg., Lincoln.

OREGON: Portland, Nov. 1. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

RUDE ISLAND: Providence, Aug. 20. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Aberdeen, Dec. 5-6. Dr. G. M. Evans, Yankton.

WISCONSIN: Madison, Sept. 20. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

Missouri Reciprocity Report

The State Board of Health of Missouri reports 13 physicians licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners, on April 24. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine	(1933)		Arkansas
University of Colorado School of Medicine	(1939)		Tennessee
Emory University School of Medicine	(1933)		Minnesota
Rush Medical College	(1937)		California
University of Illinois College of Medicine	(1914)		Illinois
State University of Iowa College of Medicine	(1937)		Iowa
Tufts College Medical School	(1937)		Maine
University of Michigan Medical School	(1937)		Michigan
Wayne University College of Medicine	(1940)		Kansas
Ensworth Medical College	(1908)		Oklahoma
Marion-Sims-Beaumont Medical College	(1902)		
Columbia University College of Physicians and Surgeons	(1923)		New York
University of Cincinnati College of Medicine	(1929)		Ohio
School	LICENSED BY ENDORSEMENT	Year Grad.	
Yale University School of Medicine	(1936)		
St. Louis University School of Medicine	(1939)		

Washington January Report

The Washington State Board of Medical Examiners reports the written examination for medical licensure held at Seattle, Jan. 13-15, 1941. The examination covered 7 subjects and included 70 questions. An average of 60 per cent in each subject was required to pass. Thirty candidates were examined, 29 of whom passed and 1 failed. Nine physicians were licensed to practice medicine by reciprocity and 3 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists	(1940)*	81.3	85.8
George Washington University School of Medicine	(1939)		82
Loyola University School of Medicine	(1935)	79.4	82
Northwestern University Medical School	(1936)	81.4	87
Rush Medical College	(1937)	79	84.5
Harvard Medical School	(1935)		87.1
University of Minnesota Medical School	(1939)		86.1
St. Louis University School of Medicine	(1939)		80.7
Creighton University School of Medicine	(1939)	83.7	84.1
University of Oregon Medical School	(1939)	83.7	84.1
University of Pennsylvania School of Medicine	(1938)		79.7
Boylor University College of Medicine	(1940)		79.1
University of Wisconsin Medical School	(1940)		86.2
McGill University Faculty of Medicine	(1937)	77.5	82.4
Medizinische Fakultät der Universität Wien	(1936)		79.4
Universität Heidelberg Medizinische Fakultät	(1939)		85.7
Universität Rostock Medizinische Fakultät	(1936)		76.5
School	FAILED	Year Grad.	
College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois	(1910)		
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists	(1940)		California
Stanford University School of Medicine	(1939)		California
University of Colorado School of Medicine	(1938)		Colorado
The School of Medicine of the Division of the Biological Sciences	(1937)		Wisconsin
University of Louisville School of Medicine	(1939)		Kentucky
Johns Hopkins University School of Medicine	(1936)		Maryland
St. Louis University School of Medicine	(1934)		Missouri
University of Oregon Medical School	(1939)		California
University of Wisconsin Medical School	(1938)		California
School	LICENSED BY ENDORSEMENT	Year Grad.	
Rush Medical College	(1938)		
University and Bellevue Hospital Medical College	(1933)		
McGill University Faculty of Medicine	(1936)		

* These applicants have completed four years' medical work and will receive the M.D. degree on completion of internship. Licenses have not been issued.

† Licenses have not been issued.

‡ This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship. License has not been issued.

Nevada May Report

The Nevada State Board of Medical Examiners reports the written examination for medical licensure held at Carson City, May 5, 1941. The examination covered 13 subjects and included 75 questions. An average of 75 per cent was required to pass. Four candidates were examined, 2 of whom passed and 2 failed. Four physicians were licensed to practice medicine by reciprocity and 1 physician so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Illinois College of Medicine	(1940)		86.7*
University of Wisconsin Medical School	(1939)		86.8
School	FAILED	Year Grad.	
University of Arkansas School of Medicine	(1907)		
University of Texas School of Medicine	(1919)		
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists	(1940)		California
Northwestern University Medical School	(1931)		Illinois
Tulane University School of Medicine	(1927)		Louisiana
University of Pennsylvania School of Medicine	(1912)		Penna.
School	LICENSED BY ENDORSEMENT	Year Grad.	
University of Maryland School of Medicine and College of Physicians and Surgeons	(1927)		

* This applicant has completed four years' medical work and will receive the M.D. degree on completion of internship. License has not been issued.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Acts: Referring of Patients to Unlicensed Persons as "Fraud or Misrepresentation in Practice."—The Arizona State Dental Board instituted proceedings to revoke Batty's license to practice dentistry on charges that (1) he was physically incompetent to practice because he was suffering from pulmonary tuberculosis; (2) he was guilty of misrepresentation in securing his license in that he represented himself at that time to be free from any malignant, infectious or contagious disease whereas he was in fact suffering from pulmonary tuberculosis, and (3) he had been guilty of fraud in the practice of dentistry in that he had (a) practiced under a name not included in his license and (b) referred certain patients to a dental laboratory wherein dentistry was practiced by unlicensed persons. After notice and hearing, the board found that all charges had been sustained and, in effect, revoked his license. The dentist brought certiorari to the superior court, Maricopa County, which affirmed the order of the board, and he appealed to the Supreme Court of Arizona.

The Supreme Court first determined that the conferring of quasi-judicial powers on an administrative body, such as the state dental board, did not violate that provision of the state constitution vesting the judicial power of the state in designated courts and that the state legislature had the right to confer on the state dental board the power to hear and determine whether acts which the legislature said would justify a revocation of a license had been committed by a particular licensee. Having so concluded, the court held that courts could by certiorari review the action of an administrative body to determine whether it had acted within its jurisdiction even though in such a review the courts could not weigh the evidence before the inferior body.

The dental practice act, said the Supreme Court, authorizes the board of dental examiners to revoke a license, among other things, for (a) physical or mental incompetency, (b) fraud or misrepresentation in securing a license and (c) fraud or misrepresentation in the practice of dentistry, all of which acts the dentist in this case was charged with committing. Proof of one charge at least was necessary to give the board jurisdiction to revoke his license.

The court concluded that the first charge against the dentist (that he was physically incompetent to practice dentistry because he was suffering from pulmonary tuberculosis) was not sustained by the evidence before the board. Unquestionably, said the court, while one afflicted with active pulmonary tuberculosis is not physically qualified to practice dentistry because of the grave danger of infection to his patients, the record does not indicate that the accused dentist was so afflicted at the time the charges were preferred. All the record indicated was that at one time the dentist had drawn compensation for tuberculosis, but the case had become arrested. A person with an arrested case of tuberculosis is of no more danger to a patient, so far as infection is concerned, than one who has never had the disease.

The court next determined that the second charge against the dentist (that he had been guilty of fraud or misrepresentation in securing his license to practice because at that time he was afflicted with tuberculosis) was also not sustained by the evidence before the board. The only evidence on this point, said the court, is that the dentist was examined by two reputable physicians just before securing his license and certified as free from active tuberculosis.

The court was not impressed with the portion of the charge that the dentist was guilty of fraud and misrepresentation in the practice of his profession because he practiced under names not included in his license. It appeared that he gave his name to the board when he was admitted to practice as Batty and practiced subsequently under the name Battie. These names,

said the court, are *idem sonans*, and the evidence shows affirmatively that the dentist had used both spellings at various times in his life without any intent to perpetrate a fraud on any one. The mere use of the two names is not evidence of fraud in his practice.

With respect to the remaining charge of fraud against the dentist, said the court, namely that he had referred certain patients to a dental laboratory wherein dentistry was practiced by unlicensed persons, the following evidence was adduced before the board: One N testified that, desiring to have a dental plate made and four teeth extracted, he went to the office of the dentist with one S, there being present in the office the dentist, S and one V, who was a partner with one P in an independent dental laboratory, neither of whom were licensed to practice dentistry in Arizona. A discussion was held among them as to whether the teeth should be extracted first and the impression made or whether the impression should be made first and the teeth extracted later, and it was decided to make the impression first. The testimony is not clear as to whether the dentist or V directed N as to what he should do, but both were present when the patient was told by one of them to go to the dental laboratory and have the impression made, and nothing was said by either about the fact that V and P were not licensed dentists, a fact which was known to the dentist. This N did some four days later and the impression was made by P, the dentist not being present. The Arizona dental practice act, continued the court, expressly prohibits such persons as P and V from making casts or impressions, unless the work is directly supervised by a licensed dentist. Three days later N returned to the dentist's office and the latter extracted four teeth. N then went to the laboratory to have the plate put in, and while he was there the dentist came in to collect the fee for the extractions. V made out a statement to N, showing the preparation of the plate and the extractions in separate items, whereon N paid V and the latter gave plaintiff the \$4 which he demanded for the extractions.

Does this testimony, said the court, if believed by the dental board, justify a conclusion that the dentist has committed fraud in his practice? The answer depends on the duty of the dentist under the circumstances. Dentists are included in the meaning of the term "physician and surgeon" as the term is used in defining the duties a physician or surgeon owes to his patients. When the relationship of physician and patient exists, it is one of trust and confidence, and the physician must in all dealings with his patient use the utmost good faith, or he is guilty of fraud. Does the conduct of the dentist, as testified to by N, constitute fraud or misrepresentation? The relationship of physician and patient did exist between N and the dentist. The dentist either advised N or heard the advice given N in his presence, without his making any comment thereon, that he should have dental services performed by P, when he knew that P was prohibited by law from performing this particular class of service, and P did therefore, to the knowledge of the dentist, perform such dental services for N. Was it the duty of the dentist to advise his patient that P was prohibited by law from doing the work which the patient desired to have done? The purpose and the only justification of the various statutes regulating the practice of medicine in its different branches is to protect the public against those who are not properly qualified to engage in the healing art, and one who is not licensed under such statutes is conclusively presumed to be unqualified. When a patient employs a physician he has the right to assume that the latter will advise him properly in all matters pertaining to his ailments, and this certainly includes advice as to who are properly qualified to assist in his treatment. Fraud may be committed by a failure to speak, when the duty of speaking is imposed, as much as by speaking falsely. We think a physician who knows that a patient of his is about to have surgical or medical work done by one who has no legal right to do it fails in his duty if he does not advise the patient of the situation.

The court accordingly concluded that the board had acted within its jurisdiction and, in effect, affirmed the order of the board revoking the dentist's license to practice.—*Batty v. Arizona State Dental Board*, 112 P. (2d) 870 (Ariz., 1941).

Malpractice: When Erroneous Diagnosis Actionable.—In a suit for malpractice against the physician defendant the plaintiff alleged that the physician undertook to treat her for a "malady, the true and exact nature of which was unknown" to her; that he failed to exercise the ordinary and reasonable skill generally exercised by members of his profession in good standing and negligently, carelessly and erroneously diagnosed her condition as tuberculosis of the lungs and advised her to confine herself to bed; that she followed his advice and remained in bed for thirteen months, and that by reason of his negligence and carelessness "her general health became permanently impaired and undermined." The trial court sustained a demurrer interposed by the physician and the patient appealed to the Supreme Court of Florida.

The defendant, said the Supreme Court, was employed not only to treat the plaintiff but first of all to determine the identity of the malady from which she suffered. If the treatment he administered was the proper treatment for the malady, the plaintiff has no cause of action. Likewise, she has no cause of action if the treatment did her no injury and her discomfort is the result of the malady from which she suffered. The court then adverted to *Osborn v. Carey*, 24 Idaho 158, 132 P. 967, in which case it was alleged that the plaintiff suffered with a disease of the leg, "which disease and ailment was well known and accompanied by peculiar signs and symptoms which an ordinary physician would detect," and that the physician negligently and unskillfully treated the patient for "blood poisoning." The Supreme Court of Idaho in that case held on appeal that the trial court should have sustained a demurrer since the declaration was vague, indefinite and uncertain because it did not allege the nature of the alleged disease from which the patient was suffering or what were the signs and symptoms of such disease which, it was alleged, were "well known and peculiar."

In the present case, said the Supreme Court of Florida, the declaration does not allege the name of the disease or malady from which the patient suffered. There is no allegation as to the signs and symptoms apparent nor that the malady was one that should have been recognized by a physician. The court then quoted from the Idaho decision, as follows:

If we assume that the exact charge of negligence as to the treatment related only to the mistake of the disease, and that the appellant had wrongfully diagnosed it as "blood poisoning," and treated the ailment on the wrong theory as to the nature of the disease, the defendant would not necessarily be liable, even though the treatment did not produce good results, for it must appear from the allegations of the complaint that the treatment was not proper from the standpoint of the consensus of opinion among physicians and surgeons of ordinary skill and learning in the profession in the locality wherein defendant practiced.

In the present case, continued the Supreme Court, for all the declaration gives us to know, the proper treatment of the malady from which the patient suffered was that which was recommended and applied by the physician. If this should be true, the defendant would not be liable for using such treatment even though it did not produce good results, for negligence cannot be presumed from the fact that a physician fails to effect a cure.

The court then quoted from *Merriam v. Hamilton*, 64 Or. 476, 130 P. 406, as follows:

A complaint, in an action by a married woman for malpractice, which alleges that she employed defendant as her physician to treat her for a headache, that he mistakenly diagnosed her case as one of pregnancy, that he negligently failed to examine her to ascertain that she was not in such condition, and failed to ascertain her true condition, and that by reason thereof she was rendered sick and injured in her health and rendered weak and nervous, states no cause of action for failing to show that her real condition was one of disease which by the exercise of ordinary skill defendant should have discovered; "disease" being defined as an alteration in the state of the body, or of some of its organs interrupting or disturbing the performance of the vital functions, or a particular instance or case of this, and the word "pain" being defined as a disagreeable feeling usually in its intenser degrees resulting from, or accompanying, deranged or otherwise abnormal action of the physical powers.

While it is sufficient to charge in general terms that an injury was negligently inflicted, the acts done must be stated, and it must appear from the facts averred, and not from mere conclusion, that the negligence caused or contributed to the injury.

The declaration in this case, said the Supreme Court, avers in effect that the patient was ill when she consulted the defendant. While it appears that she is still ill there is no allegation as to whether her condition is better or worse than when she first consulted the physician. A physician or surgeon does not insure the correctness of his diagnosis. His legal responsibility is to use ordinary skill and diligence and to apply the means and methods ordinarily and generally used by physicians of ordinary skill and learning in the practice of his profession to determine the nature of the ailment and to act on his honest opinion and conclusion. It follows that no cause of action on the grounds of an erroneous diagnosis is stated unless the plaintiff alleges the nature or identity of the malady from which she suffered; that such malady should have been recognized and diagnosed as such by a physician of ordinary skill and learning in the practice of his profession; that it was not so recognized and treated as such malady would have been treated by a physician of ordinary skill and learning, and that the treatment administered by the physician was not a proper treatment for the existing malady but resulted in damage to the plaintiff.

For the reasons stated the judgment of the trial court in sustaining the demurrer was affirmed and the cause remanded with permission to the patient to apply to the trial court for leave to file an amended declaration.—*Hill v. Boughton*, 1 So. (2d) 610 (Fla., 1941).

Medical Practice Acts: Probation as Bar to Revocation of License for Conviction of a Felony.—The jury in a United States district court found the physician involved in the present case guilty of executing a false and fraudulent document. The trial judge, however, suspended sentence on the verdict and placed the physician on probation for a period of five years. Subsequently the State Board of Medical Examiners of Florida served notice on the physician that it would proceed to hear charges filed against him for a revocation of his license to practice medicine on the ground that he had been convicted of a felony. The physician then filed a petition for a writ of prohibition in the Supreme Court of Florida to restrain the defendant from hearing the charges.

The question before the Supreme Court was whether or not the physician had been convicted of a felony within the meaning of the medical practice act in view of the fact that no sentence had ever been entered on the verdict of the jury. The Board of Medical Examiners was given authority, the court said, to revoke or cancel the license of a practitioner of medicine who had been convicted of a felony so as to prevent practitioners who had departed from the high standards required of them from continuing in practice. The court viewed the medical practice act as an instrumentality for the removal of black sheep from the honorable profession of medicine, thereby promoting the health, happiness, comfort and welfare of the people. Since sentence was never imposed on the physician, however, the court on the basis of prior decisions held that he had not been convicted within the contemplation of the medical practice act.—*Page v. State Board of Medical Examiners of Florida et al.*, 193 So. 82 (Fla., 1940).

Society Proceedings

- American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Hot Springs, Va., Sept. 11-13. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.
- American Association of Railway Surgeons, Chicago, Sept. 8-10. Dr. Daniel B. Moss, 547 West Jackson Blvd., Chicago, Secretary.
- American Congress of Physical Therapy, Washington, D. C., Sept. 1-5. Dr. Richard Kovacs, 2 East 88th St., New York, Secretary.
- National Medical Association, Chicago, Aug. 18-22. Dr. John T. Givens, 1108 Church St., Norfolk, Va., General Secretary.
- Oregon State Medical Society, Portland, Sept. 3-6. Dr. M. L. Bridgeman, 1020 S. W. Taylor St., Portland, Secretary.
- Rocky Mountain Medical Conference, Yellowstone Park, Wyo., Sept. 2-4. Mr. W. H. Tibbals, 616 McIntyre Bldg., Salt Lake City, Secretary.
- Washington State Medical Association, Seattle, Aug. 24-26. Dr. Vernon W. Spickard, 1305 Fourth Ave., Seattle, Secretary.
- Wisconsin State Medical Society of Madison, Sept. 10-12. Mr. G. B. Larson, 110 East Main St., Madison, Assistant Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases, Huntington, Ind.

8:101-148 (April) 1941

- Fate of Ingested Pectin. S. C. Werch and A. C. Ivy, Chicago.—p. 101.
Contributions Made in 1940 to Knowledge in Regard to Pancreas. R. Elman and L. A. Sachar, St. Louis.—p. 105.
Peptic Ulcer of the Aged. F. W. Mulsow, Cedar Rapids, Iowa.—p. 112.
Gastric Anacidity: Its Physiologic and Clinical Significance and Its Management. H. Shay, J. Gershon-Cohen and S. S. Fels, Philadelphia.—p. 115.
Effect of Feeding Apple Sauce on Induced Diarrhea in Rats. Z. I. Kertesz, Geneva, N. Y.; Martha S. Walker and C. M. McCay, Ithaca, N. Y.—p. 124.
Quantity of Colonic Flatus Excreted by the "Normal" Individual. J. M. Beazell and A. C. Ivy, Chicago.—p. 128.
Colloid Laxatives Available for Clinical Use. H. Gray and M. L. Tainter, San Francisco.—p. 130.
Congenital Absence of Gallbladder. P. J. Sarma, Chicago.—p. 139.

American Journal of Diseases of Children, Chicago

61:669-914 (April) 1941

- *Aphthous Pharyngitis. B. B. Breese Jr., Rochester, N. Y.—p. 669.
Measure of Metabolic Speed in Children. M. Tobias and L. Stockford, Los Angeles.—p. 675.
Paroxysmal Tachycardia and Its Treatment in Young Infants. J. P. Hubbard, Boston.—p. 687.
Simple Method for Isolation and Identification of Meningococci and Gonococci. P. L. Boisvert and Mildred D. Fousek, New Haven, Conn.—p. 710.
Big Babies and Their After-History. H. Gray, San Francisco, and H. L. Eder, Santa Barbara, Calif.—p. 717.
Supervision of Children in Contact with Tuberculosis. A. B. Robins, New York.—p. 721.
Differential Leukocyte Count Associated with Hookworm Infection. H. W. Brown, Chapel Hill, N. C., and G. F. Otto, Baltimore.—p. 727.
Regulation of Body Temperature During Sleep. R. Day, New York.—p. 734.
Primogeniture as Etiologic Factor in Pyloric Stenosis. Norma Ford, Mary A. Ross and A. Brown, Toronto, Canada.—p. 747.
Jaundice in Infants and in Children: Icteric Index as Method of Determining Type of Jaundice. Miriam Reiner and S. B. Weiner, New York.—p. 752.
Hand-Schüller-Christian Disease: Case in Which Lymphadenopathy Was Predominant Feature. Margit Freund, New York, and M. L. Rippes, Elizabeth, N. J.—p. 759.
*Myasthenia Gravis: Report of Case in Which Prostigmine Methylsulfate Was Used. S. T. Levethan, A. J. Fried and M. J. Madonick, New York.—p. 770.
*Osteochondrodystrophia Deformans (Morquio's Disease): Report of Three Cases. N. H. Einhorn, J. R. Moore, H. W. Ostrum and L. G. Rowntree, Philadelphia.—p. 776.
Glycogen Disease. H. H. Mason and Dorothy H. Andersen, New York.—p. 795.

Aphthous Pharyngitis.—In the summer of 1938 Breese observed a disease in children which he had not seen previously and which has not been described. It was characterized by a sudden onset with high fever, occasional vomiting, acute inflammation of the throat without much local soreness, abatement of fever in twenty-four hours and the appearance, frequently coincident with the drop in temperature, of a few discrete aphthous or canker-sore-like lesions on the upper portion of the tonsillar pillars. In May 1939 Levine, Hoerr and Allanson described an epidemic of "vesicular pharyngitis and stomatitis" which had occurred in three summer camps in New Hampshire during July and August of 1938. The illness closely resembled that seen by the author. During the summer of 1939 he saw no similar cases, but during June, July and August of 1940 there was a second minor epidemic of the disease in Rochester. He saw 8 cases in 1938 and 20 in 1939. Other pediatricians saw

similar cases in the city at the same time. The usual comment of the mothers was that the children were feverish but did not seem sick except for listlessness and anorexia. The mothers were puzzled by the sudden onset of the disease, usually noticed in the late afternoon or early evening. Most of the younger children had a temperature of between 103 and 104 F. There was a surprising lack of symptoms. Vomiting occurred occasionally. In a number of children seen early, numerous petechiae dotted the soft palate and anterior tonsillar pillars; the aphthous lesions appeared later. The ulcerations or aphthous lesions were more definite after the fever had subsided. The temperature was usually normal within twenty-four hours of onset, and the child appeared normal although the aphthous lesions were still present. The absence of pain and discomfort in the throat contrasted strongly with the misery associated with aphthous or herpetic stomatitis. Levine and his associates stated that 50 per cent of the campers less than 25 per cent more than 18 years of age who were exposed contracted the disease. Sixteen siblings in the author's series were exposed to the disease; 6 contracted the illness, 5 escaped it and for 5 the result of the contact was not known. The parents of the affected children did not contract the illness. For the camp series the incubation period could not be determined, although 2 patients became ill five and seven days respectively after arriving in the camp. There were 10 instances in which the time relation to a previous case could be determined with reasonable accuracy (the nearest twenty-four hours): one day in 1, two days in 2 and three days in 7. In the first of these it is possible that the first child and his probable contact had had a common exposure several days previously. Despite blood counts, direct smears, cultures and attempts to demonstrate a virus, the cause of the disease remains unknown.

Myasthenia Gravis.—Levethan and his co-workers report myasthenia gravis in a girl of 9 whose condition responded to treatment with prostigmine methylsulfate. The salient features of the 34 cases in children less than 17 years of age reported in the literature are presented. In most of these cases, as in their own, the onset of the disease was insidious. Prodromal symptoms of headache, pain and paresthesias in various parts of the body are mentioned. The initial complaints in 73 per cent were fatigability, general muscular weakness and weakness of the ocular muscles. Disturbances of speech and deglutition were late symptoms. The creatine-creatinine metabolism of 11 patients, as summarized by Milhorat and Wolff, indicated in most cases only moderate creatinuria and moderate impairment of creatine tolerance. In 2 rapidly fatal cases, however, the patients excreted large amounts of creatine. The authors agree with Adams, Power and Boothby that the chemical changes in myasthenia gravis are not uniform. Viets and Schwab analyzed their experience with prostigmine in 44 patients and express the opinion that prostigmine bromide, orally, supplemented with ephedrine sulfate, potassium chloride and, occasionally, guanidine is the most efficient available treatment. The duration of the disease in the authors' patient was eighteen months, and the average duration in the 34 reported cases was forty-five and seven-tenths months. In 13 children less than 12 years of age, the average duration was fifteen months. The authors believe that the prostigmine methylsulfate prolonged their patient's life.

Osteochondrodystrophia Deformans.—Einhorn and his colleagues cite 3 instances of Morquio's disease admitted to the pediatric division of the Philadelphia General Hospital and referred for detailed study to the Philadelphia Institute for Medical Research. Two patients were first cousins. Morquio's disease presents a group of deformities, such as pes planus, genu valgum, coxa vara, scoliosis, kyphosis, pectus carinatum, mild clubhand, humerus varus and skeletal dwarfism. They are due to structural defects and to postural changes. Osteochondrodystrophia deformans adequately describes the structural defects. Careful study of 2 patients makes it obvious that there are two distinct phases of this disease: (1) that in which structural defects accompanied by postural changes occur and (2) that in which neurologic features become manifest. With the appearance of the second phase the child becomes completely bedridden and eventually helpless. The bone changes do not

alone account entirely for this new picture. Much to the authors' surprise, definite platybasia was discovered in the only patient studied from this point of view. This observation would bring the neurologic changes in line with those seen in multiple sclerosis or amyotrophic lateral sclerosis, which, according to Chamberlain, are related to platybasia. The parents of this patient refused to permit decompression through the foramen magnum or at the first cervical vertebra. Hence the opportunity to relieve the critical and possibly fatal phase of the disease was lost. Polycythemia was observed in 2 patients; in patient 1, whose disease was most advanced, the average erythrocyte count was 4,400,000 per cubic millimeter, while for patient 3, whose disorder was least advanced, the erythrocytes numbered 5,980,000. The erythrocyte count of patient 2 was 6,240,000. It is difficult to determine whether these observations are chance occurrences or are due to compensatory phenomena incident to the extreme deformity of the chest, with compression of the lungs and faulty aeration. Morquio's disease is most often confused with rickets of infancy, late rickets and renal rickets, and chondrodystrophy. These errors usually result when the diagnosis is made in the absence of a thorough roentgen examination. A detailed necropsy on a patient with osteochondrodystrophia deformans would prove illuminating. There is no known treatment for osteochondrodystrophia deformans. Constant orthopedic care may aid in preventing or correcting the deformities of the back and extremities. It may be possible to increase the growth of these patients with the growth-promoting factor of the anterior lobe of the pituitary, supplemented by proper diet and vitamins, as it is stimulated in patients with chondrodystrophy.

American Journal of Ophthalmology, Cincinnati

24:365-484 (April) 1941

- Pathology of Carotid-Cavernous Aneurysms (Pulsating Exophthalmos). W. E. Dandy and R. H. Follis Jr., Baltimore.—p. 365.
Orbital Tumors and Their Surgical Treatment: Part 1. A. B. Reese, New York.—p. 386.
Coloboma of Optic Nerve in Human Embryo. B. F. Payne, New York.—p. 395.
Equatorial Scleral Staphyloma and Retinal Detachment Cured by Excision. D. Vail, Cincinnati.—p. 403.
Relationship Between Myopia and Avitaminosis. J. Laval, New York.—p. 408.
Significance of Sturm's Interval in Refraction. A. D. Prangen, Rochester, Minn.—p. 413.
Functions of Relative Accommodation. M. Luckiesh and F. K. Moss, Cleveland.—p. 423.
Advances in Use of Sulfanilamide Compounds in Ophthalmology. J. S. Guyton and A. C. Woods, Baltimore.—p. 428.

American Journal of Physiology, Baltimore

132:571-822 (April) 1941. Partial Index

- Mechanism of Vagal Effects on Pulmonary Ventilation. T. E. Boyd, Chicago.—p. 571.
Effect of Glycocoll (Glycine) Ingestion on Growth, Strength and Creatinine-Creatine Excretion in Man. A. S. Chaikalis, New York.—p. 578.
Studies on Choline Esterase Activity and Acetylcholine Content of Central Nervous System. R. Cortell, J. Feldman and E. Gellhorn, Chicago.—p. 588.
Reflex Studies After Muscle Transplantation. W. G. Watrous and J. M. D. Almsted, Berkeley, Calif.—p. 607.
Calory Intake and Weight Balance of Hyperthyroid Dogs in Relation to Vitamin B₁ and Yeast. V. A. Drill, Princeton, N. J.—p. 629.
Effect of Thiamine on Intestine of B₁-Deficient Rat. M. Dick and J. R. Hege Jr., Durban, N. C.—p. 636.
Cerebral Blood Flow and Brain Metabolism During Insulin Hypoglycemia. H. E. Himwich, Albany, N. Y.; K. M. Bowman, C. Daly, New York; J. F. Fazekas; J. Wortis and W. Goldfarb, New York.—p. 640.
Inherent Inadequacies of Double Histamine Test for Studies on Pepsin Secretion. Gladys R. Bucher and A. C. Ivy, Chicago.—p. 654.
Storage of Carbohydrate Food. E. M. MacKay, La Jolla, Calif., and D. R. Drury, Los Angeles.—p. 661.
Respiratory and Metabolic Effects of Hypothermia. D. B. Dill and W. H. Forbes, with technical assistance of F. Consolazio, Boston.—p. 685.
Is Histamine Able to Maintain an Augmented Pepsin Response Comparable to That of Pilocarpine? G. R. Bucher, A. C. Ivy and J. S. Gray, Chicago.—p. 698.
Quantitative Method for Measurement of Rate of Water Loss from Small Areas, with Results for Finger Tip, Toe Tip and Postero-superior Portion of Pinna of Normal Resting Adults. C. Neumann, A. E. Cohn and G. E. Bureh, New York.—p. 748.
Lactic Acid Mechanism and Certain Properties of Blood in Relation to Training. S. Robinson and P. M. Harmon, with technical assistance of E. S. Turrell and F. O. Mackel, Bloomington, Ind.—p. 757.

American Journal of Psychiatry, New York

97:1007-1260 (March) 1941. Partial Index

- *Pharmacologic Shock Treatment of Schizophrenia: Two Year Follow-Up Study from New York State Hospitals with Some Recommendations for the Future. J. R. Ross, I. M. Rossman, W. B. Cline Jr., O. J. Schworer and B. Malzberg, Wingdale, N. Y.—p. 1007.
Continued Follow-Up Results in Insulin Shock Therapy and in Control Cases. E. D. Bond, Philadelphia.—p. 1024.
Curare: Preventive of Traumatic Complications in Convulsive Shock Therapy (Including Preliminary Report on Synthetic Curare-like Drug). A. E. Bennett, Omaha.—p. 1040.
Schizophrenic Psychoses: Report of 100 Cases in the U. S. Army. J. M. Caldwell Jr., Washington, D. C.—p. 1061.
Regression Neuroses and Schizophrenia: Analysis of Forty Cases in University Students. Annette C. Washburne and E. R. Hodgson, Madison, Wis.—p. 1073.
Psychobiologic Studies Following Section of Corpus Callosum: Preliminary Report. A. J. E. Akelaitis, Rochester, N. Y.—p. 1147.
Observation Nursery: Study of 250 Children in the Psychiatric Division of Bellevue Hospital. Lauretta Bender and Helen Yarnell, New York.—p. 1158.
Bulgarian Treatment of Parkinsonism, with Special Reference to Its Effect on Mental Symptoms. R. F. Gayle Jr., Richmond, Va., and J. B. Pettis, Staunton, Va.—p. 1175.
Etiology of Pellagra. J. G. Dewan, Toronto, Canada.—p. 1188.

Pharmacologic Shock Treatment of Schizophrenia.—According to Ross and his collaborators, insulin shock treatment of schizophrenia gives an improvement rate three times as much as that resulting from the usual institutional treatment. A follow-up study of the first 1,039 patients receiving shock therapy at least two years ago shows that 472, or 45.4 per cent, have had some improvement. Of 134 who recovered thirty days after treatment was completed, only 73 remained in this category one year later. Of 282 patients who were originally much improved, only 111 remained so one year later and 43 recovered. Of 263 patients who were improved only 108 remained so a year later, although an additional 27 were much improved and 11 recovered. Of the patients who recovered a year after treatment, 78.6 per cent remained recovered after another year, or two years after the termination of treatment. The respective two year figures for the much improved and improved patients are 74.8 and 54.5 per cent. The data show that the condition of the patients with dementia praecox treated with insulin has become practically stabilized with respect to any further deterioration and that approximately 45 per cent show some degree of lasting improvement. The recovery rate remained practically constant at 13 per cent. There was a greater stability of the original results of treatment among those patients whose disease was of short duration; that is, the shorter the duration the greater the maintained improvement.

American Journal of Public Health, New York

31:297-420 (April) 1941

- Public Health Expands Its Facilities Under Title VI: Federal Social Security Act. E. R. Coffey, Washington, D. C.—p. 297.
Schistosome Dermatitis as a Bathing Place Problem. J. E. Miller, Lansing, Mich.—p. 305.
The Community Health Education Program: The Hartford Plan. B. G. Horning, Lucy S. Morgan, Beatrice Hall Kneeland and Alice H. Hammar, Hartford, Conn.—p. 310.
Public Health Applications of High Speed Photography. C. E. Turner, M. W. Jennison and H. E. Edgerton, Cambridge, Mass.—p. 319.
Value of Bacteriophage Determinations as Supplemental Procedure in Diagnosis of Bacillary Dysentery. K. M. Wheeler and A. L. Burgdorf, Hartford, Conn.—p. 325.
Role of Rats in Spread of Food Poisoning Bacteria of Salmonella Group. H. Welch, M. Ostrolenko and M. T. Bartram, Washington, D. C.—p. 332.
Comparative Study of Standard Agars for Determining Bacterial Counts in Water. W. L. Mallmann, East Lansing, Mich., and R. S. Breed, Geneva, N. Y.—p. 341.
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Determination and Characterization of Coliform Bacteria from Chlorinated Waters. M. Levine, Ames, Iowa.—p. 351.
Comparison of Methods for Sampling Lead Fume. L. B. Case, Detroit.—p. 359.
Comparative Efficiency of Plating Media for Isolation of Shigella Dysenteriae. Catherine R. Mayfield and Maud Goler, Jackson, Miss.—p. 363.

American Journal of Tropical Medicine, Baltimore
21:163-368 (March) 1941

- Control of Typhus Fever. R. E. Dyer, Washington, D. C.—p. 163.
- *Treatment of Brucellosis with Brucella Antigens. M. R. Castaneda and C. C. Cardenas, Mexico, D. F.—p. 185.
- Tenth Years' Observations on Malaria in Panama, with Reference to Occurrence of Variations in Parasite Index, During Continued Treatment with Atabrine and Plasmochin. H. C. Clark, W. H. W. Komp and D. M. Jobbins, Panama City, Republic of Panama.—p. 191.
- Clinical Observations on Renal Insufficiency in Blackwater Fever: Report of Case. E. C. Toone Jr., Richmond, Va.—p. 217.
- Historical Sketch of Prevalence of Malaria in North America. M. F. Boyd, Tallahassee, Fla.—p. 223.
- Observations on Blood Proteins During Malaria Infections. M. F. Boyd, Tallahassee, Fla., and H. O. Proske, Wilson Dam, Ala.—p. 245.
- Adaptations of White Men and Negroes to Prolonged Work in Humid Heat. S. Robinson, D. B. Dill, J. W. Wilson and M. Nielsen.—p. 261.
- Bovine Trypanosomiasis in Panama. C. M. Johnson, Panama City, Republic of Panama.—p. 289.
- Use of Baby Mice in Yellow Fever Studies. J. C. Bugher, Villavencio, Colombia, South America.—p. 299.
- Susceptibility to Yellow Fever of Vertebrates of Eastern Colombia: I. Marsupialia. J. C. Bugher, J. Boshell-Manrique, M. Roca-Garcia and R. M. Gilmore, Villavencio, Colombia, South America.—p. 309.

Brucella Antigens for Undulant Fever.—Castaneda and Cardenas treated 35 cases of brucellosis with antigens prepared from the bacterial bodies by grinding Brucella of the three varieties (abortus, melitensis and suis). The treatment aimed to induce mild or no reactions, to desensitize the patient and to increase his immune resources. The results were not as striking as some reported by other workers, but a rapid and sustained improvement without severe reactions has been observed. Thus far there have been no deaths even among patients with unfavorable prognosis. Four patients with mild brucellosis were noticeably improved from nine to forty-five days after treatment was begun and continued to improve for twenty-nine, thirty-seven, fifty-one and one hundred and five days, respectively. After these intervals there was a slight fever followed by complete recovery. Twenty-five with severe Brucella infection began to recover from three to sixty days after the institution of treatment. Treatment was continued from one to four months. Slight fever was occasionally observed during the course of treatment, but it never formed a typical brucellosis wave. The 6 remaining patients presented a grave prognosis at the outset, though they reacted to the treatment in a relatively short time (within from eleven to fifty-two days). Because of the severity of their illness the patients were kept under specific treatment for from two and a half to four and a half months.

Annals of Otol., Rhin. and Laryngology, St. Louis
50:1-312 (March) 1941. Partial Index

- Recognition, Treatment and Prevention of Hearing Impairment in Children. S. J. Crowe and C. F. Burnam, Baltimore.—p. 15.
- Analysis of Ocular Fundus Changes in Otic Sinus Thrombosis. I. Friesner, New York.—p. 32.
- Diagnostic Significance of Partial Paralysis of Facial Nerve in Chronic Suppurative Otitis Media and Mastoiditis. H. I. Lillie, Rochester, Minn.—p. 38.
- *Evaluation of Ménière Syndrome. W. E. Grove, Milwaukee.—p. 55.
- War Deafness and Its Prevention. S. R. Guild, Baltimore.—p. 70.
- Otologic Research and Its Recent Contributions to Clinical Otology. W. Hughson and Eva Thompson, Abington, Pa.—p. 77.
- Progress in Conservation of Hearing. H. Newhart, Minneapolis.—p. 129.
- Tinnitus Aurium in Light of Recent Research. E. P. Fowler, New York.—p. 139.
- *Chemotherapy in Treatment of Complications of Acute Middle Ear Suppuration (Petrositis and Meningitis). J. R. Lindsay, Chicago.—p. 159.
- Closure of Perforations of Membrana Tympani with Cargile's Membrane. W. D. Stinson, Memphis, Tenn.—p. 178.
- Further Experiences in Fenestration of Labyrinth in Chronic Progressive Deafness: Report of Cases and Analysis of Results. E. H. Campbell, Philadelphia.—p. 182.
- Surgical Treatment of Deafness: Report of Experiences with Endaural Labyrinthine Fenestration. M. S. Erssner and D. Myers, Philadelphia.—p. 206.

Evaluation of Ménière Syndrome.—Grove suggests that in determining the etiology of the Ménière syndrome more consideration be given to allergy, avitaminosis and disturbances in the endocrine balance than has been accorded heretofore. If the pathologic condition of the temporal bone described by

Hallpike is correct for every case, then the main pathologic feature is a waterlogging or edema. This condition is probably a metabolic disturbance, but whether in a water balance or in sodium ion or both is not clear. The disturbance seems to find its greatest expression in the labyrinth, where it initiates vertigo, deafness and probably also some of the tinnitus. That all of the tinnitus does not originate in the end organ is evidenced by the fact that it persists in many cases after the labyrinth is destroyed or its nerves severed. It may be that the waterlogging is operative in the end organ and also in the central cochlear nuclei. Success of dehydration, sodium elimination and histamine treatment under proper hospital supervision suggests that the patient should first be treated medically before being submitted to surgical intervention. The latter should be reserved for patients who have not responded to a medical regimen, who, for economic or other reasons, cannot be kept on a medical regimen and for patients whose occupation precludes any benefit from medical treatment because of carelessness in following its routine. Of the surgical measures proposed, total section of the acoustic nerve is indicated when the hearing in the affected ear has fallen below a usable level, and differential section of the vestibular portion of the nerve when usable hearing is present. These operations should not be hazardous when performed by a competent neurosurgeon.

Chemotherapy for Complications of Acute Middle Ear Suppuration.—Lindsay reports 7 cases of diffuse suppurative meningitis, 1 case of cisternal meningitis and brain abscess, and 2 cases of petrous pyramid suppuration without an intracranial complication. Four of the meningitis cases were secondary to petrositis. All cases were complications of acute middle ear suppuration. There were 2 deaths. Diffuse meningitis of otogenic origin has recently been cured with chemotherapy without surgical intervention, and in 4 of the cases reported the same favorable result might possibly have been obtained without operation. In the presence of an abscess inside the dura or a focus of necrosis in the temporal bone and in the presence of an extradural abscess, chemotherapy alone fails to sterilize the focus. Concentrations of sulfanilamide of 14 or more mg. per hundred cubic centimeters of blood were maintained for from several days to two weeks without success. Symptoms were usually relieved but reappeared sometimes before, but usually after, the drug was withdrawn. Six of the 10 cases reported were of this latter type. It appears that chemotherapy alone is most likely to be successful in cases in which a complication has developed rapidly before gross destruction of bone has taken place, in the type of bone with pneumatization of the limited small cell type or in the presence of partial sclerosis. Chemotherapy appears to relieve the urgency of surgery, but, when clinical evidence indicates suppuration in the mastoid or pyramid, surgical excision and chemotherapy provide greater safety than chemotherapy alone. The protection afforded by chemotherapy should be the initial step in the treatment whenever an impending extension of suppuration is suggested. The masking of symptoms which follows chemotherapy apparently can be interpreted as a desirable effect, indicating a definite limitation of the infectious process. Greater vigilance may be necessary under chemotherapy, but when true indications for surgical drainage are present the drug seldom obviates its necessity. The efficacy of drug therapy depends largely on the extent of pneumatization. The virulence of the infecting organism and the degree of the host's resistance represented by immune bodies in the blood serum are other factors which influence the success of drug therapy. Synergistic action of sulfanilamide and immune serum has been claimed experimentally, and it may have clinical significance. Recurrences or exacerbations of meningitis developed in 3 patients after the blood concentration of the drug had been allowed to decrease to 6 or 7 mg. per hundred cubic centimeters when the disease appeared to be subsiding. The disease thereafter was prolonged and more resistant to therapy. The best results were obtained when an initial blood level of 15 or more mg. per hundred cubic centimeters was maintained for from five to seven or more days, decreasing it only two or three days after the spinal fluid approached normal. The widespread use of the sulfon-

amide drugs appears to have reduced the number of surgical operations. However, in certain cases moderate concentrations of the drug do not prevent the development of surgical complications.

Archives of Internal Medicine, Chicago

67:709-894 (April) 1941

- *Vascular Allergy: Pathogenesis of Bronchial Asthma with Recurrent Pulmonary Infiltrations and Eosinophilic Polyserositis. J. Harkavy, New York.—p. 709.
- Chronic Hemolytic Anemia with Paroxysmal Nocturnal Hemoglobinemia: Report of Case with Only Occasional Hemoglobinuria and with Complete Autopsy. G. C. Ham and H. M. Horack, Philadelphia.—p. 735.
- Present Status of Nicotinic Acid. V. P. Sydenstricker, Augusta, Ga.—p. 746.
- Electrocardiographic Studies in Case of Periodic Paralysis. B. Stoll and S. Nisnewitz, Brooklyn.—p. 755.
- *Precocious Puberty and Tumors of Hypothalamus: Report of Case and Review of Literature, with Pathophysiologic Explanation of Precocious Sexual Syndrome. L. M. Weinberger, Chicago, and F. C. Grant, Philadelphia.—p. 762.
- Clinical Studies on Vitamin B₁ Excretion Determined by Fermentation Method. H. Pollack, M. Ellenberg and H. Dolger, New York.—p. 793.
- Clinical Studies on Blood Diastase: I. Low Blood Diastase as Index of Impaired Hepatic Function. S. H. Gray, J. G. Probst and C. J. Heifetz, St. Louis.—p. 805.
- Id.: II. Significance of Increased Blood Diastase. C. J. Heifetz, J. G. Probst and S. H. Gray, St. Louis.—p. 819.
- Effect of Edema and Integumentary Infiltrations on Basal Metabolism, Electrocardiogram and Blood Cholesterol. E. Moschowitz, New York.—p. 828.
- *Persons Lacking Sweat Glands: Hereditary Ectodermal Dysplasia of Anhidrotic Type. F. W. Sunderman, Philadelphia.—p. 846.
- Clinical Use of Sulfamethylthiazole. W. H. Kammerer, M. Kalkstein and S. Solomon, New York.—p. 855.
- Liver and Biliary Tract: Review for 1940. C. H. Greene, New York.—p. 867.

Vascular Allergy.—Harkavy discusses types of vascular sensitization as manifested by 8 patients in whom, with a single exception, asthma was the cardinal symptom. He believes that the asthma was but one expression of the underlying vascular allergy and that it appeared concurrently or alternately when other tissues subject to the same allergenic stimulation were involved. With one exception (bronchospasm and cough), the patients came to the hospital because of severe bronchial asthma. Inquiry revealed the existence of allergy in the families of 2, and a personal history in 4. The intradermal cutaneous tests of 5 patients disclosed positive reactions to pollens and foods. The reactions were clinically significant only in 3. The major etiologic role was attributed in most of the patients to bacterial allergy emanating from chronically infected sinuses. Coincident with the asthmatic attacks, interstitial pulmonary infiltrations, abnormal electrocardiographic changes and pleural effusions of eosinophils appeared in 6 of the patients, and in 3 there was pericardial involvement. These signs were reversible and disappeared with the asthmatic seizures in 4, only to recur with their recrudescence. In the patient who did not have asthma, in addition to the pleuropulmonary infiltrations and electrocardiographic changes there was swelling of the elbow and a hemorrhagic necrotic lesion in Scarpa's triangle. All this disappeared with the recovery of the patient in three months. Biopsy from the necrotic lesion showed an inflammatory reaction with perivascular infiltration of eosinophils, and the nodule showed areas of periarteritis nodosa. Acute pericarditis, the pericardial reaction, reverted to normal within three weeks in 1 case and progressed in 2 to a chronic adhesive stage. The electrocardiographic abnormalities consisted in deflections and amplitudes of the T waves and the QRS complexes. These remained permanent in 2 patients who ultimately died. The occurrence of eosinophils in the sputum, in the serous exudates and in the perivascular infiltrations in the skin, associated with periarteritis nodosa in the 1 case, implies active involvement with increased permeability of vessels of the lungs, serous membranes and cutaneous tissues. Thus it might be assumed that the recurrent interstitial pulmonary infiltrations revealed on roentgen examination, accompanied by eosinophils in the sputum, eosinophilic exudates in the pleura and the electrocardiographic changes, were probably also due to hyperergic vascular reactions in these tissues similar to those revealed by biopsies of the skin. As the asthmatic paroxysms ran a course parallel

with that of the pulmonary lesions, they may be considered as symptomatic expressions of the underlying reactions in the vessels of the lungs and bronchi. Since the asthmatic seizures and the altered vascular responses in other shock organs appeared simultaneously and were evidently dependent on the same allergenic stimulation, they must be regarded as but one aspect of a more diffuse vascular and mesodermal reaction. The serous membrane and cardiac reactions suggest that they were sequelae of hyperergic vascular reactions. The concurrent reversible electrocardiographic changes with the asthma and the pleuropulmonary lesions were probably influenced by the same mechanism. In 1 of the 2 cases in which these changes were irreversible, thickening of small arteries, arteritis and perivascular fibrosis were found in the myocardium at necropsy. The increase in eosinophils and leukocytes in the bone marrow indicates that the marrow participated as a shock organ.

Precocious Puberty and Tumors of Hypothalamus.—Weinberger and Grant report a case of precocious puberty accompanied by hypothalamic tumor, this being the seventeenth instance recorded. The tumor was a glioma of the third ventricle and the hypothalamus. Apart from the unusual clinical features, it is the second instance of precocious puberty to be studied from the endocrinologic point of view. The patient, a boy of 7 years and 11 months, survived an operation (performed two and a half months before the time of writing) in which a large mass of the tumor was removed. On the basis of endocrinologic studies the authors offer the following explanation of the genesis of precocious puberty: Lesions of the posterior portion of the hypothalamus interrupt nerve pathways or interfere with mechanisms which normally inhibit and control the production and release of gonadotropic substances from the anterior lobe of the hypophysis. The excessive liberation of these pituitary substances stimulates the ovaries or the interstitial cells of the testes to overproduction of their respective estrogenic or androgenic substances responsible for the development of secondary sexual characters. The proof of the hyperactivity of the anterior lobe of the hypophysis is found indirectly in the presence of abnormally large amounts of estrogenic and androgenic substances in the urine of patients with precocious puberty. The clinical features of the authors' patient did not emphasize involvement of the hypothalamus. This was not unusual, as the tumor largely involved the posterior segment of the hypothalamus. Vegetative symptoms (somnolence, adiposity, diabetes insipidus and polyphagia), by which a hypothalamic tumor may be recognized, are usually present when the anterior portion of the hypothalamus is involved. In their patient the available observations indirectly point to predominant involvement of the posterior part of the hypothalamus. All the physical attributes of puberty, if not of adulthood, were present. Of particular interest was the presence of seminal fluid containing a full complement of motile spermatozoa. This indicates that the gonadotropic principle of the anterior lobe of the pituitary (the follicle stimulating factor) was present in sufficient amount to stimulate the spermatogenic cells to mature activity. Further proof of activity of the testicular interstitial cells is to be had from the adult amounts of androgenic substance assayed in the urine. The interstitial cells are dependent for their stimulation and activation on the second principle from the anterior lobe of the pituitary, the luteinizing gonadotropic factor. Thus there is satisfactory indirect evidence that the anterior lobe of the hypophysis was releasing excessive quantities of the gonad stimulating substances. Whereas the patient's urine contained as high as 45 international units of an androgen in a twenty-four hour specimen, the normal daily excretion of androgen in an 8 year old boy is, according to Nathanson, Towne and Aub, from 6 to 9.9 international units. The final and conclusive link must await the experimental attempt to produce precocious puberty in young animals by producing similar lesions in the posterior portion of the hypothalamus.

Persons Lacking Sweat Glands.—Sunderman reports the occurrence of hereditary ectodermal dysplasia in 3 brothers, members of a family of 10 children of Italian parents. A cursory survey of the parents and the 7 other children shows them to be apparently normal and relatively healthy with no apparent congenital defects. Although no accurate genealogic

data are available, it is asserted that the grandparents, aunts, uncles and cousins presented none of the defects observed in the 3 brothers, who, it is said, appeared normal at birth and during early infancy. The chief complaints of the 3 patients are fever and headache when exposed to high temperatures. As the patients grew older, normal deciduous teeth failed to develop, they never perspired and 2 of them could not shed tears. In childhood their noses became of the saddle type and their lips negroid. Hair failed to appear over their extremities, and the hair of their scalps, pubes and axillas was sparse. The 2 older boys (20 and 22, the third is 5) complained of a continuous, fetid nasal discharge since childhood and observed that they had lost their ability to distinguish odors. They have been extremely intolerant of high temperatures, and during the last few summers the 2 older ones found it necessary to apply water over their underclothing to keep reasonably cool. Neither of the 2 older patients is capable of performing physical work during the summer months. The 2 older patients have kept interval records of their oral temperature; during March and April, taken four times daily, it ranged from 97.4 to 98.6 F. and during July and August from 97 to 102.6 F. The lowest temperatures were usually observed during the morning and the highest in the afternoon and evening. Increase in the respiratory and pulse rates was coincident with elevations in the temperature. The 3 brothers have all been alert, cooperative and of normal intelligence. The 2 older patients graduated from high school with rank in the upper third of their classes. During their school years medical attention was focused principally on their unexplained fever. It is suggested that the sweating response of certain persons suffering with unexplained fever might profitably be investigated. The effects of exposure to a high environmental temperature for thirty minutes were studied in 2 of the patients and compared with 2 control subjects. In the patients the loss of weight corresponded approximately to the insensible loss that normally occurs in resting persons at normal temperatures; in the 2 control subjects the loss was about sixteen times as great. In the 2 patients hyperpnea and diuresis ensued; in the control subjects they did not.

Archives of Ophthalmology, Chicago

25:539-760 (April) 1941

- Development and Prevention of Myopia at the United States Naval Academy. R. Hayden, Annapolis, Md.—p. 539.
- *Treatment of Thrombosis in Central Vein of Retina with Heparin. R. L. Rea, London, England.—p. 548.
- Some Practical Considerations Pertaining to Corneal Edema. D. G. Cogan, Boston.—p. 552.
- Ocular Findings Associated with Dysostosis Multiplex and Morquio's Disease: Report of a Case of the Former. C. A. Veasey Jr., Spokane, Wash.—p. 557.
- Mechanics of Optic Nerve Traction on Retina During Ocular Rotation, with Special Reference to Retinal Detachment. B. Friedman, New York.—p. 564.
- Characteristics of Sensitometric Refraction. M. Luckiesh and F. K. Moss, Cleveland.—p. 576.
- Principles of Surgical Ocular Therapy Interpreted in the Light of Modern Ophthalmic Science, with Brief Study on Evolution of Ocular Therapeutics from Prehistoric Age Up to the Modern Period. N. K. Bidyadhar, Sonpur Raj, Orissa, India.—p. 582.
- Dietyoma in Early Stage: Report of Case. H. Imre, Budapest, Hungary.—p. 629.
- Orbital Implants, with Special Reference to Vitallium. W. B. Doherty, New York.—p. 637.
- Causes of Blindness in Hawaii. W. J. Holmes and Grace C. Hamman, Honolulu, Territory of Hawaii.—p. 643.
- Prism Compensation in Cases of Anisometropia. P. L. Cusick and H. W. Hawen, Rochester, Minn.—p. 651.
- *Treatment of Gonorrheal Diseases of Eye with Sulfanilamide: Three Years' Clinical Experience. C. R. Mullen, Philadelphia.—p. 655.
- Uveoparotitis (Heerfordt): Note on Prognosis. S. I. Kaufman, Chicago.—p. 659.
- Blackberry Thorn in Anterior Chamber of Eye for Twelve Years. E. C. Albers, Champaign, Ill.—p. 662.
- Supernumerary Caruncle: Report of Case. B. Friedman, New York.—p. 664.
- Gonioscopy and Glaucoma. H. S. Sugar, Chicago.—p. 674.

Heparin for Thrombosis of Central Retinal Vein.—Rea administered heparin to 5 patients with thrombosis of the central vein of the retina; 3 had complete trunk thrombosis and 2 branch thrombosis. Failure was complete in only 1 instance of trunk thrombosis; the eye became glaucomatous and blind. In the remaining 2 some improvement was evident. In the

2 patients with branch thrombosis complete cure resulted, central vision in each being 6/6. In one of these patients vision rose from 6/36 on July 21 to 6/6 on October 21 and has remained the same since; the retina has been absolutely free from hemorrhages. The author points out that heparin can also be used for extensive hemorrhage into the retina or the vitreous. The cost of the product is the greatest obstacle to therapy. It is not necessary to keep the patient in bed. Ambulatory patients can have two injections daily, each from 100 to 125 mg. The needle should not be too small and, when the injection is made into the vein, slight pressure should be applied to prevent non-coagulable blood from escaping into the subcutaneous tissues.

Sulfanilamide for Gonorrheal Ophthalmia.—According to Mullen, 42 patients with gonorrheal infection of the eye have been treated with sulfanilamide administered locally and internally. The therapy decreased the incidence of corneal complications and the period of hospitalization. It is the belief of the physicians in the ocular services at the Philadelphia General Hospital that if this treatment is followed rigidly gonorrheal ophthalmia will become one of the less serious ocular diseases. Of the 42 patients 14 were infants with ophthalmia neonatorum of gonorrheal origin, and 28 had gonorrheal infection of the conjunctiva and cornea. All the infants were discharged without corneal involvement, but there were 5 patients with corneal complications on discharge among the 28 other patients. The treatment now followed at the Philadelphia General Hospital is to give sulfanilamide internally in doses of from 1 to 2 grains (0.065 to 0.12 Gm.) per pound of body weight, but never more than 100 grains (6 Gm.), for the first twenty-four hours of hospitalization. The involved eye is irrigated with 2 per cent solution of boric acid followed by free instillation of an 0.8 per cent solution of sulfanilamide every ten minutes day and night. For infants the prescribed amount of sulfanilamide is crushed and placed in water in a feeding bottle. Studies of the blood are performed before and during treatment. Toxic effects of sulfanilamide have not been encountered. After twenty-four hours of treatment the internal dose of the drug is decreased to $\frac{1}{4}$ to $\frac{1}{2}$ grain (0.016 to 0.03 Gm.) for each pound of body weight, and local irrigations are continued at longer intervals. The use of a 0.25 to 1 per cent solution of atropine sulfate (strengths vary according to the patient's age), ice wet applications for ten minutes every hour and a Bullar shield when only one eye is involved complete the therapeutic measures. No patient is ready for discharge until results of examination have been negative on three successive days and there are no sequelae or complications requiring further treatment. After three years the method has evolved itself into almost a constant series of treatments during the first twenty-four hours. Even a meal or a feeding is not completed without interruption for irrigation and instillation of solution of sulfanilamide. Up to now the number of patients admitted each year has not decreased, but there has been a definite decrease in the number discharged with corneal involvement.

Archives of Physical Therapy, Chicago

22:193-256 (April) 1941

- *Present Status of Ultraviolet Irradiation. F. H. Krusen, Rochester, Minn.—p. 199.
- Use of Thermophore for Detachment of Retina. H. M. Langdon, Philadelphia.—p. 212.
- Present Status of Radiation Therapy in Nasal Sinusitis. A. G. Levin, Miami, Fla.—p. 217.
- Principles of Radiation Therapy of Head and Neck Neoplasms. G. A. Robinson, New York.—p. 220.
- Newer Developments in Orthoptics, with Reference to Reading Problems. O. B. Nugent, Chicago, and Vivienne Ilg, Evanston, Ill.—p. 225.
- Conduct of an Orthoptic Clinic. I. S. Tassman, Philadelphia.—p. 232.

Present Status of Ultraviolet Irradiation.—Krusen states that ultraviolet irradiation produces photochemical effects which activate substances in the skin and possibly in the blood. The rays also produce biologic effects, stimulation of metabolism, cellular activity, growth and circulation. Ultraviolet radiation in wavelengths shorter than 315 millimicrons will prevent and cure rickets. Irradiation with these wavelengths will impart an antirachitic potency to fats, milk, ergosterol, 7-dehydrocholesterol (eleidin), oils and vegetables. Such radiation causes

delayed or latent erythema of the skin in human beings, improves the tone, color and elasticity of the skin and presumably increases the cutaneous secretory and protective powers. Ultraviolet irradiation increases the active oxygen content of the lipids of the skin and thus enhances their bactericidal action. General exposure to ultraviolet radiation will increase the number of erythrocytes, leukocytes, blood platelets and hemoglobin of the circulating blood and will decrease the hydrogen ion concentration, coagulation time and eventually the blood volume. A transient lowering of blood pressure follows exposure to ultraviolet rays. Wavelengths longer than 290 millimicrons presumably have stimulative effects on the human body. Wavelengths shorter than 290 millimicrons may be lethal to cells of the human body. General exposures to ultraviolet rays improve muscular tone and increase protein metabolism and mineral metabolism and the ability of the organism to utilize more effectively materials which are present but not absorbed from the intestine. Ultraviolet irradiation imparts an antirachitic potency to cow's milk and pregnant or nursing mothers.

Canadian Medical Association Journal, Montreal

44:327-440 (April) 1941

- Recent Advances in Medicine—Etiology and Therapy. A. H. Gordon, Montreal.—p. 329.
 War Wounds. W. E. Gallie, Toronto.—p. 338.
 Emphysema Under 40: Clinical and Pathologic Significance. P. M. Andrus, London, Ont.—p. 344.
 Psychologic Factors in Aviation. M. R. Harrower-Erickson, Montreal.—p. 348.
 *Intracranial Use of Sulfonamides: Experimental Study of Histology and Rate of Absorption. E. F. Hurteau, Montreal.—p. 352.
 Glomus Tumors: Clinical Picture and Physiology. J. H. Couch, Toronto.—p. 356.
 *Pathology of Glomus Tumors. A. J. Blanchard, Toronto.—p. 357.
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 Multiple Glomus Tumors: Four in One Finger Tip. B. Plewes, Toronto.—p. 364.
 Etiology of Sydenham's Chorea: Electroencephalographic Studies. S. J. Usher and H. H. Jasper, Montreal.—p. 365.
 Bacteriology of Acute Otitis Media and Its Course Under New and Old Methods of Treatment. E. P. Fowler Jr., New York.—p. 372.
 Dietary Management of Intestinal Tuberculosis. A. S. Kennedy, in collaboration with O. Snider, J. S. Hazen and C. McLean, Hamilton, Ont.—p. 380.
 Management of Nutritional Anemia of Infancy. K. L. McAlpine, London, Ont.—p. 386.
 Upper Abdominal Pitfalls: Differential Diagnosis and Surgical Treatment. G. H. Stobie, Belleville, Ont.—p. 390.
 Combined Nupercaine Spinal and Cyclopropane Anesthesia. R. H. Meredith, Toronto.—p. 394.
 General Evolution of Acquired Syphilis. A. Marin, Montreal.—p. 397.
 Test for Activity in Pulmonary Tuberculosis: Study of 200 Cases. S. H. Martin and P. S. Yu, Seoul, Korea.—p. 399.

Intracranial Use of Sulfonamides.—Hurteau inserted powdered sulfanilamide, sulfapyridine or sulfathiazole into one of two cerebral wounds made in 25 cats. The other wound was used as a control. The operations were carried out under aseptic technic. The results obtained rule out any contra-indications to the use of these drugs in this manner. There were accumulations of polymorphonuclear leukocytes about the meninges in several cats inconsistent with observations in others. The distribution of these accumulations and the fact that they were present in both wounds and remained in the treated wound after the drug was completely absorbed suggested that they were due to the presence of foreign bodies (silver clips and sutures). This was proved conclusively in 2 cats in which a silver clip was placed in the wound without the drug but not in the wound containing the drug, and the leukocyte reaction was seen only about the silver clip. The drug was seen macroscopically or microscopically as late as twenty days. The drug even while present caused but a minimal focal foreign body reaction. There was no constant evidence of neuron destruction or glial reaction resulting from its application to incised cerebral wounds. The ultimate healing of wounds in no way suggested that they increase scarring or are carcinogenic. Sulfapyridine was the slowest to be absorbed but could not be detected after thirty-four days; sulfathiazole could not be detected after seventeen days and sulfanilamide after eleven days.

Glomus Tumors.—Blanchard regards glomus tumor as a benign overgrowth of the normal cutaneous glomus. It reproduces the microscopic picture of the normal glomus, showing an increased number of vascular channels and a corresponding hyperplasia of glomus cells. The tumors are single but may be multiple and may occur anywhere in the skin but particularly under finger and toe nails. The tumors are surrounded by a fairly definite collagenous capsule and are composed of a network of vascular channels simulating those of the normal glomus. These channels are lined by a single layer of flattened or slightly swollen endothelial cells, and external to this layer are varying numbers of glomus cells. Some of the channels have a zone of collagenous fibers separating the endothelium from the glomus cells. In some tumors the number of glomus cells are few and the tumors may suggest hemangioma. In others the cells are many and may even grow in dense compact sheets suggesting an epithelial tumor. In the latter, areas are present which resemble a normal glomus. The glomus cells as seen in tumors are similar to those in the normal cutaneous glomus but as a rule they are larger. They have round or oval, slightly vesicular, nuclei and an abundant pale or slightly eosinophilic cytoplasm. In the author's 4 cases there appeared to be no smooth muscle elements in the tumors. There may be considerable mucoid degeneration in the masses of the tumor cells. The tumors are encapsulated, and in the capsule as well as in the tumor proper are a number of nonmyelinated nerve fibers which can best be demonstrated by the Gros-Bielschowski method. Trauma is the only etiologic factor recognized, and it is not present in the majority of cases. The tumors are benign, and their excision usually produces a cure.

Cancer Research, Philadelphia

1:181-258 (March) 1941

- Dietary Fat and Tumor Formation. P. S. Lavik and C. A. Baumann, Madison, Wis.—p. 181.
 Tumor Glycolysis: IV. Effect of Feeding Thyroid Supplemented by Thiamine Chloride on Growth and Glycolysis of Walker Sarcoma 319 in Rats. Frances F. Beck and J. C. Krantz Jr., Baltimore.—p. 188.
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 Influence of Terminal B Avitaminosis with Attending Low Body Temperature on Growth Characteristics of Sarcoma 180. F. Bischoff and M. Louisa Long, Santa Barbara, Calif.—p. 217.
 Effects of Reduced Temperatures on Growth and Metabolic Changes of Sarcoma 180 Grown in Vivo. Anna Goldfeder, New York.—p. 220.
 Effect of Age on Connective Tissue of Uterus, Cervix and Vagina of Rat. Ethel Burack, J. M. Wolfe, Winifred Lansing and A. W. Wright, Albany, N. Y.—p. 227.
 Structure and Origin of Uterine and Extragenital Fibroids Induced Experimentally in Guinea Pig by Prolonged Administration of Estrogens. A. Lipschütz and L. Vargas Jr., Santiago, Chile, South America.—p. 236.

Endocrinology, Los Angeles

28:521-680 (April) 1941. Partial Index

- Vitamin B Complex and Adrenalectomy. W. G. Clark, Minneapolis.—p. 545.
 Effect of Desoxycorticosterone Acetate on Early Pregnancy. H. O. Burdick and Evelyn J. Konanz, Alfred, N. Y.—p. 555.
 Metabolism of Dogs with Permanent Diabetes Produced by Anterior Pituitary Extract. F. C. Dohan, A. H. Chambers and C. A. Fish, Philadelphia.—p. 566.
 Percutaneous Administration of Estrogens Followed by Progesterin in Inducing Sexual Receptivity in Spayed Guinea Pigs. J. A. Leighty, H. J. Wick and B. E. Jeffries, Indianapolis.—p. 593.
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 Effect of Testosterone Propionate, Estradiol Benzoate and Desoxycorticosterone Acetate on Kidneys of Adult Rats. J. B. Luddlen, E. Krueger and I. S. Wright, New York.—p. 619.
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 Rate of Absorption of Androgens and Estrogens in Free and Esterified Form from Subcutaneously Implanted Tablets. C. W. Emmens, London, England.—p. 633.
 Influence of Testosterone on Distribution and Excretion of Creatine. M. Williamson and A. Gulick, Columbia, Mo.—p. 654.
 Continuous and Discontinuous Treatment with Estrogens in Experimental Tumorigenesis. A. Lipschütz, F. Rodriguez and L. Vargas Jr., Santiago, Chile, South America.—p. 664.
 Prevention of Experimental Uterine and Extragenital Fibroids by Testosterone and Progesterone. A. Lipschütz and L. Vargas Jr., Santiago, Chile, South America.—p. 669.

Iowa State Medical Society Journal, Des Moines

31:181-230 (May) 1941

- Basic Growth Types. A. A. Werner, St. Louis.—p. 181.
Sulfonamides in Puerperal Sepsis. A. W. Diddle and W. F. Mengert, Iowa City.—p. 189.
Statistical Review of 109 Consecutive Cholecystectomies. L. H. Kornder and R. C. Hovde, Davenport.—p. 192.
*Postmortem Cesarean Section. T. A. Moran, Melrose.—p. 195.

Postmortem Cesarean Section.—Moran reports a successful posthumous cesarean section and states that the available literature of the last decade contains 13 such cases. The patient had been under antepartum care since the third month of gestation and under observation for three years previously because of hypertension, when the author received an urgent call to come to her home. She was an obese multipara, 41 years of age, in the ninth month of her fourth pregnancy. Her last pregnancy was eighteen years before. The other 3 children were living and in good health. Previous urinalyses were negative for sugar and albumin. It was evident that she was suffering from a cerebral accident (from which her mother and sister died at 65 and 45 years of age respectively). She had stertorous breathing, the right arm and leg were completely paralyzed; she was unable to speak but could open her mouth and protrude her tongue when requested. Fetal heart tones could be heard but after a few hours were not positively discernible because of the patient's noisy respirations and the thickness of the abdominal wall. The cervix was not sufficiently dilated to admit the index finger. It was felt that death was inevitable in a few hours. The plan was to deliver the baby by cesarean section immediately after her death. She lapsed into coma and died eight and one-half hours after the onset of the stroke. Immediately after her death the abdomen was opened by a long incision. The uterus was opened in like manner and an 8 pound (3,840 Gm.) male infant was delivered. Efforts at resuscitation were begun even before the umbilical cord was severed. The baby was breathing regularly after fifteen minutes and crying lustily. He has since progressed normally.

Journal of Clin. Endocrinology, Springfield, Ill.

1:285-374 (April) 1941. Partial Index

- Thyroid Deficiency: The Problem of Endemic Goiter in Yunnan Province. R. C. Robertson, Shanghai, China.—p. 285.
Cretinism: Lack of Response to Anterior Pituitary Growth Principle. E. E. Beard, Cleveland.—p. 293.
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Adrenocortical Syndrome: Adrenal Cortex in Its Relation to Virilism. N. Mintz and S. H. Geist, New York.—p. 316.
Pituitary Dwarfism: Metabolic Changes by Extracts of Anterior Hypophysis in Primary-Pituitary and in Nonpituitary Dwarfs. J. A. Greene and G. W. Johnston, Iowa City.—p. 327.
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Recurring Ulcerative Stomatitis and Vulvitis: Report on Patient Successfully Treated by Estrogen Administration. V. Moseley, Durham, N. C.—p. 346.
Eunuchoidism: Estrogen Treatment in Female Eunuchoid. M. A. Goldzieher and M. S. Adler, New York.—p. 349.
Male Hypogonadism: Clinical Effect of Oral Use of Methyl Testosterone in Eunuchoidism. C. S. Byron and P. Katzen, Brooklyn.—p. 359.

Journal of Experimental Medicine, New York

73:453-570 (April) 1941

- Experimental Poliomyelitis in Cercopithecus Aethiops Sabaeus (the Green African Monkey) by Oral and Other Routes. J. D. Trask and J. R. Paul, New Haven, Conn.—p. 453.
Heterologous Transplantation of Mammalian Tumors: I. Transfer of Rabbit Tumors to Alien Species. H. S. N. Greene, Princeton, N. J.—p. 461.
Id.: II. Transfer of Human Tumors to Alien Species. H. S. N. Greene, Princeton, N. J.—p. 475.
New Growth Factor Required by Certain Hemolytic Streptococci. D. W. Woolley, New York.—p. 487.
Effect of Polysaccharide Splitting Enzyme on Streptococcal Infection. G. K. Hirs, New York.—p. 493.
Hereditary Transmission of Western Type of Equine Encephalomyelitis Virus in Wood Tick, Dermacentor Andersoni Siles. J. T. Syverton and G. P. Berry, Rochester, N. Y.—p. 507.
Effect of Tyrosinase on Experimental Hypertension. H. A. Schroeder and M. H. Adams, New York.—p. 531.
Interaction of Host and Bacterium in Development of Communicability by Streptococcus Haemolyticus. A. F. Coburn and Ruth H. Pauli, New York.—p. 551.

Journal Industrial Hygiene & Toxicology, Baltimore

23:129-162 (April) 1941

- Toxicology of Oxides of Nitrogen: I. Toxic Concentrations. L. W. La Towsky, E. L. MacQuiddy and J. P. Tollman, Omaha.—p. 129.
Id.: II. Physiologic Effects and Symptomatology. E. L. MacQuiddy, L. W. La Towsky, J. P. Tollman and A. I. Finlayson, Omaha.—p. 134.
Id.: III. Gross and Histologic Pathology. J. P. Tollman, L. W. La Towsky, E. L. MacQuiddy and S. Schonberger, Omaha.—p. 141.
Modified Eyepiece Micrometer for Use in Dust Counting. W. B. Harris, New York.—p. 148.
Quantitative Microchemical Colorimetric Determination of Carbon Disulfide in Air, Water and Biologic Fluids. R. W. McKee, Boston.—p. 151.

Journal of Investigative Dermatology, Baltimore

4:95-180 (April) 1941

- Studies with Antigens: VII. Significance of Reactions to Intracutaneous Tests Performed with Extracts of Purified House Dust. B. G. Efron, C. H. Boatner and M. R. Pabst, New Orleans.—p. 95.
Chick Embryo as Culture Medium for Spirochaeta Pallida. U. J. Wile and J. S. Snow, Ann Arbor, Mich.—p. 103.
Further Studies in Arspenamine Hypersensitiveness in Guinea Pigs: II. Attempts at Experimental Specific Sensitization of Guinea Pigs to Quinine, to Acetylsalicylic Acid and to Barbitol, With and Without Preceding or Concomitant Arspenamine Sensitization. W. Frei, New York.—p. 111.
Nutritional Dermatoses in Rat: III. Gangrene and Spontaneous Amputation of Digits Produced by Combined Deficiency of Vitamin B₆ and Filtrate Components. M. Sullivan and Jane Nicholls.—p. 123.
*Prevention of Bismuth Gingivitis by Use of Sodium Hexametaphosphate. I. M. Felsher and K. K. Jones, Chicago.—p. 135.
Experimental Studies with Dermatophytes: III. Development and Duration of Immunity and Hypersensitivity in Guinea Pigs. E. D. DeLamater, New York.—p. 143.
Studies of Photosensitivity Due to Sulfanilamide. H. F. Blum, Washington, D. C.—p. 159.
Observations on Persistence of Sensitivity of Eczematous Type After Prolonged Periods of Removal from Contact with Allergen. Naomi M. Kanof and A. Rostenberg Jr., Washington, D. C.—p. 175.

Prevention of Bismuth Gingivitis.—Felsher and Jones found that sodium hexametaphosphate in a fine powder eliminates oral uncleanness, tartar on enamel, carious teeth and roots and oral foci of infection responsible for the bluish pigmentation of the gums or more serious mucous membrane lesions of patients receiving bismuth therapy. Fifteen parts of it to eighty-five parts of talc was used on a tooth brush, and this was found to remove calcareous deposits, tartar and food deposits from teeth and gums, preventing formation of mucous plaques. It is not injurious to tissues. Patients in the syphilis clinic were instructed to use it as a tooth powder on a brush after each meal and at bed time. Of 150 patients under treatment during 1938 and 1939, 100 showed some oral manifestations attributable to bismuth. The use of this powder reduced noticeably the incidence and severity of bismuth reactions in the oral cavity. In 8 of the patients bismuth therapy was suspended or reduced because of rapidly progressive lesions of the buccal cavity. After from two to six weeks of using the powder, 6 of the patients were put on full doses of bismuth. In 1 patient with extensive foci of infection the powder failed to check a rapidly developing bismuth pigmentation accompanied by a severe ulcerative stomatitis. In six months, during which time use of the powder was persisted in and the patient received proper dental treatment, general tonics and no antisyphilitic therapy, full recovery was made with freedom from lesions or pigmentation in the mouth. A course of mapharsen and a course of bismuth in half doses given since has not been followed by signs of intolerance. The remaining patient of the group was a young woman receiving antisyphilitic treatment in the third trimester of pregnancy. After the first injection of bismuth a severe stomatitis and gingivitis followed. Several carious teeth with irritated alveolar processes were found. Previous mild caries was augmented by the decalcification process during pregnancy. The patient was given the powder to cleanse the mouth, and mapharsen was substituted for bismuth. In a few weeks the lesions in the mouth healed. The patient continued with arsenical injections to the end of her term. The results are inconclusive, as bismuth therapy was not resumed and its suspension was probably sufficient cause for recovery. Sodium hexametaphosphate did not intensify tooth decay. Four patients who retained an intolerance to bismuth, even after proper dental

care, and who before they began to use the powder were never able to finish a course of bismuth therapy because of heavy oral pigmentation or gingivitis and stomatitis, have all since the use of the metaphosphate powder been able to finish two or three full courses of bismuth with only mild reactions. Eight patients with definite indications for dental treatment, before antisyphilitic therapy was begun, were given the powder immediately after the examination, and in from one to three weeks they were able to begin bismuth injections while they were still receiving dental care. Inspection of the oral cavity during and after the bismuth course revealed only faint deposits on the gums. Of the 80 remaining patients some showed different degrees of pigmentation of the gums, others complained of a soreness of the gums, and the oral hygiene of others was poor. All these patients using the powder continued with their bismuth and arsenical therapy, and the pigmentation of some became fainter despite continued treatment, while in others the lesions did not progress. About one half of the patients who complained of soreness of the gums or mouth were relieved after using the powder. There was a definite improvement of the mouth hygiene in all those who had oral lesions.

Journal-Lancet, Minneapolis

61:105-142 (April) 1941

- Early Diagnosis of Tuberculosis. K. Emerson, New York.—p. 105.
Tuberculosis Situation in Peking: October 1940. T. L. Kuo, Peking, China.—p. 106.
Various Tuberculous Lesions in One Family Group. E. J. Simons, Swanville, Minn.—p. 108.
Tuberculosis Among Student Nurses. B. S. Pollak and S. Cohen, Jersey City, N. J.—p. 111.
Complete Community Surveys for Tuberculosis. R. Davies, Nopeming, Minn.—p. 113.
Thoracic Surgery in the Insular Tuberculosis Service of Puerto Rico. J. Smith, Rio Piedras, Puerto Rico.—p. 122.
*Acute Respiratory Infections Including Lobar Pneumonia and Atypical Pneumonia in a Young Adult Group. C. A. McKinlay and D. W. Cowan, Minneapolis.—p. 125.
Intracapsular Cataract Extraction. W. H. Fink, Minneapolis.—p. 134.

Acute Respiratory Infections in Young Adults.—McKinlay and Cowan studied records of the University of Minnesota students whose respiratory infections were severe enough to warrant hospitalization in the students' infirmary. The study includes all hospitalized cases of acute infection of the upper part of the respiratory tract from the school year 1934-1935 through the school year 1939-1940 and all hospitalized cases of pneumonia from the school year 1930-1931 through the school year 1939-1940. There were more than 3,100 admissions. The following observations were made: 1. From 20 to 43 per cent of all admissions to the Students' Health Service hospital during the last six years were acute respiratory infections, including pneumonia. 2. The most frequent respiratory infection requiring hospitalization was the common cold and its complications (coryza, pharyngitis, laryngitis and tracheobronchitis). 3. Increases in the incidence of influenza and influenza-like infections have been observed on alternate years. 4. The incidence of follicular tonsillitis and follicular pharyngitis varied inversely with that of the influenza and influenza-like infections. 5. An analysis of leukocyte counts in the various diseases revealed that the highest counts occurred in follicular tonsillitis and pharyngitis, while the influenza group had the lowest counts. However, during 1937-1938 there was a distinct tendency toward a higher count in the influenza group than in other years. 6. Follicular tonsillitis and follicular pharyngitis had typical short courses with crisis-like defervescence regardless of treatment. Complications were uncommon. 7. During the last ten years there were 79 instances of frank lobar pneumonia with only 1 death. This low mortality is believed to be due largely to the great resilience of young adults, relative lack of chronic predisposing factors and prompt hospitalization and treatment. 8. During the last six years 92 students had pneumonia other than frank lobar pneumonia as compared with 61 instances of lobar pneumonia during the same period. There was only 1 death among the 92 patients. 9. About one half of patients with lobar pneumonia and about three fourths of those with other pneumonias gave histories of preceding infections of the upper part of the respiratory tract. However, an increased incidence of such respiratory infections does not necessarily cause an

increase in the incidence of pneumonia. 10. During the last two years, particularly the school year 1938-1939, there was an increased incidence of "atypical pneumonia," while that of frank lobar pneumonia decreased. The most common etiologic agent isolated from the sputum of the patients with atypical pneumonia has been the streptococcus, rarely the pneumococcus. 11. Specific serum therapy and chemotherapy have lessened the intensity and duration of pneumonia. However, the low mortality among those who did not receive these forms of treatment emphasizes the importance of age in evaluating the results of special pneumonia therapy in large groups of patients.

Journal of Nutrition, Philadelphia

21:321-430 (April) 1941. Partial Index

- Arsenic and Goiter. G. R. Sharpless and Margaret Metzger, Detroit.—p. 341.
Utilization of Calcium of Milk by Adults. Herta Breiter, Rosalind Mills, Julia Dwight, Beula McKey, Williamina Armstrong and Julia Outhouse, Urbana, Ill.—p. 351.
Basal Metabolism and Heat Loss of Young Women at Temperatures from 22 to 35 C. J. D. Hardy, A. T. Milhorat and E. F. Du Bois, with technical assistance of G. F. Soderstrom, New York.—p. 383.
Urinary Excretion of Thiamine on High Fat and High Carbohydrate Diets. W. M. Cahill, Detroit.—p. 411.

Journal of Thoracic Surgery, St. Louis

10:373-484 (April) 1941

- *Differentiation of Bronchiogenic Carcinomas. P. W. Gebauer, Cleveland.—p. 373.
Surgical Aspects of Carcinoma of Esophagus: Review of Literature and Report of Four Cases. A. Ochsner and M. DeBakey, New Orleans.—p. 401.
Experimental Esophagogastronomy. B. N. Carter, J. Stevenson and O. A. Abbott, Cincinnati.—p. 446.
Lobectomy in Case of Injury of Hilum of Lung: Report of Two Cases. O. W. F. Monod, Paris, France.—p. 475.
Experimental Pneumonectomy with Obliteration of Bronchial Stump. E. S. Stafford, Baltimore.—p. 480.

Differentiation of Bronchiogenic Carcinomas.—Gebauer believes that cancer of the lung cannot be regarded as a single entity and that bronchoscopy is of diagnostic value in early cases. The author epitomizes the data on 216 patients admitted to Cleveland City Hospital and diagnosed as having primary pulmonary carcinoma. Of 158 microscopically proved cases, small cell carcinoma was present in 53, adenocarcinoma in 32, squamous cell carcinoma in 61, carcinoma simplex in 5, and the material (aspiration biopsies, pleural fluid) in 7 was insufficient to make a diagnosis of tumor type. Sixty-six per cent of the small cell carcinomas arose in the main stem bronchi, 70 per cent of the adenocarcinomas arose in secondary branches, 20 per cent in small branch bronchi and 10 per cent in the main bronchi, and 70 per cent of squamous cell carcinomas originated in the first branches of the main stem bronchi. The earliest symptoms of bronchial cancers are cough, vague thoracic sensations, hemoptysis and pleural pain. The average period from the beginning of bronchiogenic carcinoma and death is between one and two and one-half years. The author is of the opinion that symptoms tend to occur early and that those patients with no pulmonary complaints until the tumor is advanced or until metastases occur are exceptions. Physical examination, bronchoscopy and even posteroanterior roentgenograms may be negative at the onset of symptoms, but special roentgen studies and careful bronchography will reveal the cause for the complaint. Despite the variable factors of age, site and size, the gross morbid anatomy of each of the three bronchogenic tumors is distinctive enough roentgenographically. Early in the course of the small cell carcinoma an irregular mass in the roentgenogram which blends with the mediastinum and does not have a sharp outline may be seen. The primary mass enlarges rapidly and extends into the mediastinum. The early roentgenogram of an adenocarcinoma frequently displays a sharply circumscribed, dense mass separate from the mediastinum. Late in the disease it is prone to produce secondary tumor nodules in both lungs. The early squamous cell carcinoma is seen as a nodule in the lung which is not entirely peripheral and less sharply circumscribed than the primary adenocarcinoma. The original tumor may be indistinct because of surrounding inflammatory infiltration. Because of their frequent origin in the main bronchus and a tendency to form large mediastinal masses, most small cell tumors show distortion and

fixation. Late in the disease the tracheobronchial tree is fixed. With adenocarcinoma, bronchoscopy may be negative despite a large tumor within the pulmonary parenchyma, or it may suggest an endobronchial tumor. Late in small cell carcinoma the mediastinal involvement may be extensive. When squamous cell carcinoma originates in the upper lobe bronchus, bronchoscopy may be negative; but if the bronchus is occluded there is a telltale mediastinal shift, a slight climb of the hilus, and it may be impossible to see the orifice. Occasionally a retrograde telescope will permit visualization. In all probability, if performed early, bronchoscopy will be negative in roughly 40 per cent of cases. Therefore a negative bronchoscopy means only that bronchography, sputum examination, aspiration biopsy or thoracoscopy should be performed until there is sufficient evidence to warrant exploration or a diagnosis is established. For if a tumor exists it is probably operable and one should not "wait to see what happens." Because of its central location, rapid growth and potent invasive and metastatic powers there is little hope that many cases of small cell carcinoma will be cured by excision. Tumors in secondary bronchi diagnosed early may be removed completely by pneumonectomy. Exploration is contraindicated when a large mediastinal mass, esophageal deformity and vocal cord or diaphragm paralysis are present. The same is true of a tumor within 2 cm. of the carina, enlarged, hard paratracheal lymph nodes and widening of the bifurcation with fixation of the carina. Adenocarcinoma arising in the periphery of the lung is most favorable for excision. Aspiration biopsy under fluoroscopic control should not be attempted in early tumors within the hilus or if pulmonary abscess exists. The delay incurred by repeated biopsies is probably more harmful than exploratory thoracotomy. Distant metastases, secondary nodules in the lung, pleural fluid containing tumor cells and bronchoscopic evidence of mediastinal invasion contraindicate surgery. The frequent origin of squamous cell carcinoma in secondary bronchi, slow growth and mild metastatic tendencies favor complete removal. Tumors arising in the lower lobe bronchi are within reach of the bronchoscope early and are so located that wide resection is feasible. The upper lobe tumors invade the hilus, encase the pulmonary artery and frequently involve the mediastinal pleura. Although extensions occur late, their microscopic diagnosis is difficult before they extend into the main bronchus; only exploration will yield material for biopsy. Horner's syndrome, brachial plexus disturbances, vocal cord or diaphragmatic paralysis, extensive rib destruction and extreme bronchial fixation contraindicate exploration.

Journal of Urology, Baltimore

45:513-646 (April) 1941

- Unilateral Kidney with Partial Occlusion of Renal Artery Associated with Hypertension: Case Report. T. F. Riggs and R. W. Satterthwaite, Pierre, S. D.—p. 513.
- Primary Carcinoma of Ureter: Report of Four Cases. H. M. Stang and A. J. Hertzog, Eau Claire, Wis.—p. 519.
- Metastatic Ureteral Obstruction Following Carcinoma of Ovary: Report of Unusual Case of Pyonephrosis Resulting from Metastatic Carcinoma of Ureter. J. A. Lazarus, New York.—p. 527.
- Mixed Leiomyoma and Lymphangioma of Epididymis: Report of Case. B. Halpert, New Orleans.—p. 536.
- Effect of Testosterone Propionate on Benign Prostatic Hypertrophy. J. W. Draper, G. Slaughter and C. Denslow, New York.—p. 539.
- Oral Administration of Methyl Testosterone in Male Castrate. Rita S. Finkler and G. M. Cohn, Newark, N. J.—p. 548.
- Influence of Temperature on Internal Secretory Activity of Transplanted Ovaries in Male Rat. A. K. Lampton and A. J. Miller, Louisville, Ky.—p. 552.
- Influence of Psoas Major Muscle on Kidney Function. D. K. Rose, St. Louis.—p. 558.
- Pneumopyelonephrosis in Diabetes Mellitus: Case Report. J. C. Alexander, Dallas, Texas.—p. 570.
- Stones at Uteropelvic Junction. H. M. Spence, Dallas, Texas.—p. 579.
- Cutaneous Ureterostomy: Report of Twelve Cases. A. I. Folsom and H. A. O'Brien, Dallas, Texas.—p. 587.
- Ureterocle. M. F. Campbell, New York.—p. 598.
- Refinements in Technique Imperative for Successful Transurethral Prostatectomy. O. J. Wilhelm, St. Louis.—p. 612.
- Perineal Prostatectomy: Results in Primary Wound Closure. P. Adams, Omaha.—p. 622.
- Four Simple Cystoscopic Rules for Successful Resection. H. S. Browne, Tulsa, Okla.—p. 635.
- Experiences with Sulfathiazole in Treatment of Gonorrhea in Male. L. Stockwell, Kansas City, Mo.—p. 636.

Kentucky Medical Journal, Bowling Green

39:119-152 (April) 1941

- Treatment of Paresis in the Home. L. M. Foltz, Lakeland.—p. 123.
- Congenital Pyloric Stenosis. U. H. Smith, Louisville.—p. 129.
- Hoarseness, an Important Symptom. S. Watkins, Louisville.—p. 134.
- Lymphatic Leukemia. M. F. Beard, Louisville.—p. 138.
- Historical Sketch of the Louisville Eye and Ear Society. C. K. Beck, Louisville.—p. 143.
- Pentothal Sodium Anesthesia as Used in Small Hospital. Katherine Fisher, Murray.—p. 145.

Laryngoscope, St. Louis

51:315-398 (April) 1941

- Examination in the History of Otology. V. Robinson, Philadelphia.—p. 315.
- Endaural Fenestration of Horizontal Semicircular Canal for Otosclerosis: Indications, Technique, Observations as to Early and Late Postoperative Results. J. Lempert, New York.—p. 330.
- Plastic Surgery of Nose. S. Cohen, Philadelphia.—p. 363.
- Cellulitis of Face with Osteomyelitis of Frontal Bone as Complication. O. W. Thoeny, Phoenix, Ariz.—p. 378.
- Acute Laryngotracheobronchitis with Reports of Fourteen Cases Which Came to Tracheotomy. G. O. Cummings, Portland, Maine.—p. 382.

Minnesota Medicine, St. Paul

24:215-292 (April) 1941

- Gout—A Forgotten Disease. E. L. Tuohy, Duluth.—p. 215.
- Practical Points in Female Sex Hormone Therapy. J. R. Manley, Duluth.—p. 219.
- Diethylstilbestrol: Synthetic Estrogenic Hormone. M. H. Hoffman, St. Paul.—p. 222.
- Diagnosis of Pancreatitis. M. W. Comfort, Rochester.—p. 225.
- Extrapleural Pneumothorax. G. A. Hedberg, Nopeming.—p. 230.
- Retinal Manifestations of Subacute Bacterial Endocarditis. P. S. Hagen, Boston.—p. 237.
- Treatment and End Results in Appendicitis. R. F. Mueller, Two Harbors.—p. 243.
- Appendectomies. C. G. Ochsner, Wabasha.—p. 249.

New England Journal of Medicine, Boston

224:583-626 (April 3) 1941

- Treatment of Diabetes with Diet and Insulin. A. Marble, Boston.—p. 583.
- Diabetes in Youth. Priscilla White, Boston.—p. 586.
- Diabetic Hazards. E. P. Joslin, Boston.—p. 589.
- *Treatment of Pneumococcal Pneumonia, with Special Reference to Use of Sulfathiazole, Intramuscular Serum, the Francis Test and Histaminase. C. A. Janeway and P. B. Beeson, Boston.—p. 592.
- Pain Associated with Renal Aplasia: Report of Two Cases. H. S. Sabin and G. G. Smith, Boston.—p. 598.
- Intussusception of Jejunum Due to Carcinoid Tumor. S. Mufson and E. A. Horowitz, New York.—p. 602.
- Endoscopy. E. B. Benedict, Boston.—p. 605.

Treatment of Pneumococcal Pneumonia.—Janeway and Beeson report their experience with 80 cases of pneumococcal pneumonia treated between October 1939 and June 1940. All but a single case fell into one of the thirty-two pneumococcus types of Cooper. The average age of patients was 49 years. This is considerably above that usually reported. Bacteremia was found in only 10. That the gross mortality rate in a small series of cases depends considerably on chance is borne out by the 9 deaths in which the pneumonia was complicated by other serious debilitating diseases or was far advanced when therapy was begun. The general plan of treatment was to administer sulfapyridine or sulfathiazole to all patients and in addition to give serum to all patients with types of pneumonia for which serum was available. By giving serum the dosage of the drug can be reduced considerably. Patients not receiving sulfonamides eat better, and their convalescence is more rapid. Sulfathiazole is comparable to sulfapyridine in its effectiveness and has the advantage of causing less nausea than sulfapyridine. However, the urinary output must be carefully watched during its administration, as suppression of urine was its commonest toxic manifestation. In most cases it is not necessary to continue chemotherapy until liberation of antibodies is expected. Relapse seldom occurs if therapy is discontinued after three to four days. Serotherapy intramuscularly has the advantage of avoiding thermal reactions and in conjunction with chemotherapy is a practical procedure in many cases, especially when severe. The Francis test properly controlled aids in estimating serum dosage. Histaminase was not found to have any action in preventing the occurrence of serum sickness.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Surgery, Bristol

28:337-516 (Jan.) 1941

- Treatment of Tumors of Parotid Gland, with Special Reference to Total Parotidectomy. H. Bailey.—p. 337.
 Mesenteric Vascular Occlusion. T. Moore.—p. 347.
 Seminoma in Abdominal Testis with Glioma of Brain. M. J. Bennett-Jones and C. V. Harrison.—p. 357.
 *Duodenal Diverticula and Their Complications, with Particular Reference to Acute Pancreatic Necrosis. R. F. Ogilvie.—p. 362.
 Surgical Removal of Fasciola Hepatica from Common Bile Duct, with Commentary on This Infection in Man. P. Manson-Bahr and J. Walton.—p. 380.
 Use of Fascial Graft in Cure of Inguinal Hernia. J. C. F. L. Williamson.—p. 384.
 Bronchoscopic Clinic. J. E. G. McGibbon and E. T. Baker-Bates.—p. 404.
 Secondary Infection in Tuberculous Sinuses. R. B. McMillan.—p. 415.
 Persistent Intussusception in Adult: Case. N. F. Kirkman, with an anatomic note by T. Barlow and S. Mottershead.—p. 426.
 Cartilaginous Tumor of Shaft of Ulna. T. V. Pearce and D. H. Collins.—p. 432.
 Role of Vitamin C in Wound Healing. A. H. Hunt.—p. 436.
 Cholesterosis of Gallbladder: Further Contribution to Histology of This Condition. W. A. Mackey.—p. 462.
 Nutritional Edema as Complication of Jejunoileic Fistula. S. De Navasquez.—p. 468.
 Antiseptics in Brain Wounds: Experimental Study of Histologic Reaction of Cerebral Tissues to Various Antiseptic Solutions. Dorothy S. Russell and M. A. Falconer.—p. 472.

Duodenal Diverticula and Pancreatic Necrosis.—The 4 cases reported by Ogilvie demonstrate that (1) a perivaterine diverticulum may produce definite obstruction of the pancreatic duct and (2) that the association of acute pancreatic necrosis with a perivaterine diverticulum is probably neither vague nor accidental but that the conditions may be related as effect and cause through the factor of duct obstruction. In case 1 the diverticulum produced gross obstruction and dilatation of both the pancreatic and common bile ducts, with resultant atrophy of the pancreas and death from obstructive jaundice. In cases 2, 3 and 4 the diverticulum was associated with acute pancreatic necrosis. These 3 cases favor the view that the disease of the pancreas is obstructive in origin. Complications of duodenal diverticula may be classified as obstruction (duodenum, common bile duct and pancreatic duct), diverticulitis (the possible sequelae of which are perforation, peridiverticulitis, duodenitis and cholangitis), content of calculi (enteroliths and gallstones) and carcinoma. Despite the frequency of duodenal diverticula as revealed by postmortem and roentgen investigations, complications are rare, but examples of each are found in the literature.

Lancet, London

1:407-436 (March 29) 1941

- *Relative Value of Sulfonamides and Antiserums in Experimental Gas Gangrene. J. Gordon and J. W. McLeod.—p. 407.
 Prevention of Pyrexial Reactions in Intravenous Therapy. F. A. Knott and B. Leibel.—p. 409.
 Oxygen Capacity of Blood After Soluble Hexobarbitone Anesthesia. E. A. Pask.—p. 411.
 Toxic Manifestations of Antisiphilitic Therapy: Further Observations on Capillary Resistance. G. Horne and H. Scarborough.—p. 412.
 Percutaneous Tuberculin Test. F. D. Hart.—p. 414.
 Acute Lung Abscess Treated with Sulfapyridine. J. S. Richardson.—p. 415.

Sulfonamides and Antiserums in Experimental Gas Gangrene.—Gordon and McLeod state that from their experience in the control of experimentally induced gas gangrene infection in mice and guinea pigs, together with other work already published, it seems likely that the sulfanilamide drugs will have only a limited prophylactic value and that local administration is more useful than oral. The drugs are not likely to be useful in treatment except when a mixed infection with an aerobe susceptible to them exists. In experimental work the drugs are inferior to antiserums in the prophylaxis of gas gangrene. Antiserums are much more effective in prophylaxis than in treatment, and therefore while its prophylactic use is justified it is doubtful whether its therapeutic use is. It would therefore be well if the official recommendation to use antiscrums only for

treatment and not for prophylaxis were reversed, provided waste was avoided. However, there is no justification for withholding them from any person threatened with gas gangrene. Administration should take the form of multiple injections of serum into the muscles in the vicinity of the wound.

Tubercle, London

22:55-78 (March) 1941

- The Folk-Lore of Pulmonary Tuberculosis. J. D. Rolleston.—p. 55.
 *Extrapleural Pneumothorax: Review of Results. F. A. H. Simmonds and A. G. Hounslow.—p. 66.

Extrapleural Pneumothorax.—Simmonds and Hounslow discuss the results of forty-eight extrapleural pneumothoraces performed at least a year ago on 44 patients from 17 to 45 years of age. All the patients had careful sanatorium treatment, generally with long periods of rest in bed before and after operation. Operation was thought to be desirable in a patient with a still active lesion suitable for ordinary pneumothorax treatment but in whom the pleura was adherent. An intrapleural or extrapleural pneumothorax was established to control disease in the opposite lung of 10 patients. The sputum was positive for tubercle bacilli before forty-five of the operations and repeatedly negative in 3 patients. The immediate technical result was satisfactory following thirty-nine and unsatisfactory following nine operations. Patients were placed in the latter group if the size of the extrapleural space obtained was too small, the extrapleural adhesion was too dense to permit operation, the lung was injured or if the patient died during anesthesia before an incision was made. The extrapleural space of 4 patients was joined to an already existing intrapleural pneumothorax (extrapleural pneumolysis or fenestration). The stripping of the two layers of pleura from the wall of the chest should not be too extensive, as there is risk of hemorrhage, which constitutes a serious complication. The space should collapse at least the upper third of the lung as far as the hilus and, to be successful, the mediastinal surface should be freed. Some fluid formed in most patients. The space should be aspirated through a wide bore needle the day after the operation, all blood and serum removed and the space filled with air; otherwise the risk of losing the pneumothorax is considerable. The space is refilled daily for a few days and afterward at longer intervals according to roentgen indications. Seven patients died; anesthetic (no incision made), empyema and diabetes, and shock and hemorrhage were each the cause of 1 death, pulmonary injury caused the death of 2 and empyema the death of 2 patients. The present condition of the 44 patients (i. e. after an average of twenty-eight months of observation) is quiescent in 26, improved in 3 and unsatisfactory in 5 and 10 patients died; 7 from the operation and 3 from pulmonary tuberculosis. At present the sputum of 30 patients is negative and of the remaining 4 positive. The space of 23 patients is still maintained as a pneumothorax. The pneumothorax of 11 patients was supplemented by phrenic nerve crushing on the same side, in 5 the extrapleural pneumothorax was converted to an oleothorax, 10 had pneumothorax of the other lung and 5 have had thoracoplasties. Paralysis of the diaphragm was found valuable in those patients in whom a cavity persisted, or formed, in the lung below the lower margin of the extrapleural space, and the operation appeared to control this complication and rendered the sputum negative in several cases. None of the 11 patients showed any evidence of massive collapse of the lower lobe. Conversion to oleothorax was thought desirable when the space showed a tendency to obliteration. The maneuver is worthy of further trial, although it is dangerous if the extrapleural operation has not been successful in closing cavities present before operation. Extrapleural pneumothorax was established in 4 of the 10 patients who had bilateral collapse and an intrapleural pneumothorax in the other 6. Two of the patients who had subsequent thoracoplasty had no extrapleural space created owing to the density of the adhesion between the pleura and the endothoracic fascia. In the other 3 the space obtained became obliterated and the disease again became active; 1 of these patients died immediately after thoracoplasty. The other 4 patients are well and the tuberculosis appears to be quiescent.

Annales Pædiatrici, Basel

156:65-128 (Jan.) 1941

- *Treatment of "Summer Diarrhea" with Bacteriophage. A. Eckstein and I. Doğramaci.—p. 65.
New Aspects of Old Pirquet Reaction. E. Mayerhofer.—p. 84.
Treatment of Meningococcic Meningitis with Sulfapyridine. L. von Monakow.—p. 92.
Epidemiologic Aspects of the 1937 Epidemic of Poliomyelitis in Zurich. W. Abegg.—p. 115.
Activity Curve of Kathepsin of Gastric Juice. E. Freudenberg.—p. 124.

Bacteriophage in Treatment of "Summer Diarrhea."

Eckstein and Doğramaci report observations on the treatment of infants and young children with "summer diarrhea." The importance of this problem in warm countries like Turkey is evident from the summer peak in child mortality. Since purely dietetic treatment is ineffective in these infectious diarrheas, the authors resorted to treatment in moderately severe and severe cases with polyvalent antidyentery serum and obtained satisfactory results. In mild cases they employed successfully acetarsone, acetyltannic acid and calcium lactate. For some time the authors resorted to the use of bacteriophages. They report 268 cases, of which 200 were under dispensary care and 68 under clinic care. Of the dispensary group 30 were mild, 134 of moderate severity and 36 severe; the last group included 8 with toxicosis. The children were given daily for from one to six days 30 cc. of bacteriophage by mouth. The results were on the whole satisfactory. Only one, however, of the 8 cases of toxicity was cured. The others became aggravated or terminated in death. Results obtained in the clinic with the bacteriophage treatment were slightly less favorable than those obtained in the dispensary material, probably because of greater severity of the clinic cases. Of 40 children treated at the clinic with polyvalent antidyentery serum only 8 were not improved or cured. This confirms earlier favorable results with this therapy. The serum therapy appeared to be superior to bacteriophage. However, bacteriophage treatment is more simple because it is administered orally while serum must be injected. Serum treatment causes sensitization, which may result in complications in subsequent administration. More observations will be necessary to determine which method is preferable. Medicinal treatment (acetarsone, acetyltannic acid and calcium lactate) was effective in only one half of the 30 cases in which it was employed. Thus, it appears that under the same conditions the bacteriophage therapy is superior to the drug therapy. In cases with toxicosis the bacteriophage method is ineffective, whereas serum therapy is successful in about two thirds of the cases, thus making serum therapy the method of choice. The bacteriophage treatment requires less time than the medicinal treatment but more time than serum therapy. The authors feel that bacteriophage therapy of "summer diarrhea" calls for further investigation.

Gazzetta degli Ospedali e delle Cliniche, Milan

61:993-1012 (Dec. 15) 1940. Partial Index

- *Bacteriology of Blood and Bone Marrow in Lobar Pneumonia. A. Cattaneo.—p. 995.

Bacteria in Blood and Bone Marrow in Pneumonia.

Cattaneo took cultures of the blood and sternal bone marrow from 106 patients with lobar pneumonia. Bacteremia was present in 18 cases, in all of which the same type pneumococcus was identified in the blood and in the marrow. Pneumococci persisted both in the blood and in the bone marrow all through the disease up to the time when fever abated or death occurred. Mortality amounted to 44 per cent for the group of patients with bacteremia and to 9 per cent in the group without bacteremia. The type percentage of pneumococci identified in the blood and bone marrow was 50 per cent for type III, 22.2 per cent for type I, 16.6 for type IV and 11.2 for type II. Pneumococci of the same type were identified from blood, bone marrow and sputum in all cases of bacteremia. The presence of pneumococci in the blood aggravates the prognosis. Pneumococcemia of types I, II and IV is not severe, while pneumococcemia of type III is fatal in almost all cases. Bacteremia is more frequent and of graver prognostic significance in patients over 40. Pneumococcemia of type III in old patients is fatal in 100 per cent. The method of repeatedly obtaining blood and marrow cultures has no advantage over that of single cultures.

Revista de la Assoc. Med. Argentina, Buenos Aires

55:85-170 (Feb. 15-28) 1941. Partial Index

- *Sulfanilamide in Bronchopulmonary Suppuration. M. R. Castex, E. L. Capdehourat and A. Lavarello.—p. 85.
*Nasopharyngeal Torticollis. H. E. Querol and N. M. Estevez.—p. 148.

Sulfanilamide by Spray for Bronchopulmonary Suppuration.

Castex and his collaborators report several cases of bronchopulmonary suppuration in which various routine therapeutic methods, including large doses of sulfanilamide by mouth or by injection, have failed. From 3 to 5 cc. of a 5 per cent sulfanilamide solution was diluted in 25 cc. of distilled water and was sprayed through a mouth piece every four hours. The patient was asked to breathe through the mouth during the spraying with his nostrils closed. He was not allowed to wash his mouth or blow his nose immediately after spraying. The treatment was administered for about three months, about 50 Gm. of sulfanilamide being utilized. Improvement was evident from the first or second week, and it increased as the treatment progressed. The temperature became normal in about one or two weeks, the sputum gradually changed to normal, and the patient regained his appetite, and gained in weight. The favorable change in the local condition could be followed in repeated roentgenograms. Treatment may be discontinued when fever, clinical symptoms and sputum are absent for some time and when there are signs of a satisfactory general condition, normal blood picture, normal sedimentation rate of the erythrocytes, disappearance of pathologic shadows and evidence of local fibrosis in roentgenograms. The authors believe that local sulfanilamide therapy attenuates the virulence of the bacteria, prevents a spread of the local infection to neighboring tissues and stimulates organic defense against the infection. The treatment is harmless and well tolerated.

Nasopharyngeal Torticollis.—Querol and Estevez direct attention to the type of acquired torticollis from acute trauma or suppuration of the nasopharynx. The head is inclined to one side but does not rotate. Roentgen examination of the cervical segment of the spine shows deviation without rotation of the head. The condition is due to posttraumatic contracture of the paravertebral muscles. Early immobilization of the neck in a Schanz collar maintained throughout the course of the nasopharyngeal condition prevents permanent torticollis. In the two cases reported by the authors early immobilization of the neck was resorted to. The patients were cured, and normal movements of the neck were restored.

Revista de Higiene, Bogotá

21:1-60 (May-June) 1940. Partial Index

- *Blue Dermatosis of People of Chillos Plateau. J. J. Escobar A.—p. 38.

Tropical Blue Disease.—Escobar describes a new type of chronic dermatosis among people who lived in the Colombian Chillos Plateau for a long time. The prominent lesions are squamous dermatitis on areas of dark blue pigmentation of the skin, alternating with areas of achromia and dyschromia, exfoliation and ulcerations of mucous membranes, especially those of lips and lids. Areas of normal pigmentation, such as those of the areola of the nipple and of the scrotum, are not involved. The bare parts of the body are more frequently involved than the protected parts. The sensitivity of the skin is well preserved. The lesions are not pruriginous. The morphologic blood picture is normal for persons of that region. The incidence is the same for peoples of different race, age and sex. Alopecia and general adenopathy are commonly present. The removed ganglions contain fine grains of pigment. Serologic tests for syphilis give strongly positive results in all cases. The patients, however, have neither a history nor clinical symptoms of syphilis. The ulcers follow a slow course and do not heal spontaneously. Spirochetes can be isolated from the skin, lesions, ulcers and ganglions. It is a new species of *Spirochaeta*, different from *Spirochaeta pallida* and *Spirochaeta carateum*. Administration of two doses of 0.3 and 0.4 Gm. of arsphenamine, respectively, results in disappearance of the spirochetes and cure of the lesions. The disease must be differentiated from vitiligo, leprosy, syphilis and carcinoma.

Archiv für Dermatologie und Syphilis, Berlin

181:1-138 (May 10) 1940. Partial Index

- *Clinical Aspects and Etiology of Hodgkin's Disease. W. Richter.—p. 1.
Fibromangioma-Forming Syndrome of Lymph Glands and Skin, Which Is Related to Group of "Sarcomatosis Kaposi." E. Cappelli.—p. 12.
Clinical Observations on Behavior of Ullrich and of Dissectal B and C in Organism of Patients with Gonorrhea. W. W. Kühnau.—p. 28.
Pathogenesis of Hypersensitivity to Flour and Persulfate in Persons Working with Flour. H. A. E. von Dishoeck and D. J. Roux.—p. 34.
Malarial Therapy of Syphilis. H. Strobel.—p. 41.
Cutaneous Metastases of Malignant Hypernephroid Tumors. F. Nödl.—p. 57.

Hodgkin's Disease.—Richter reports a case of Hodgkin's disease with cutaneous lesions presenting the picture of urticaria papulosa chronica perstans. His patient developed lymph node enlargement following injection of a solution of procaine hydrochloride-epinephrine in the course of dental treatment. He felt weak and complained of drawing pains. In the course of the next dental treatment the blood picture was examined every five minutes and a considerable increase in lymphocytes was noted. The leukocytes increased in numbers for twenty-five minutes following the injection and gradually subsided. The sedimentation speed was increased. Lymph nodes reacted in the same manner on subsequent dental treatments. Cultures from dental granulomas of the patient disclosed a mixed flora of staphylococci and streptococci. Two weeks after termination of dental treatment the lymph nodes were in the same condition as before the treatment. The cutaneous lesions showed appreciable improvement. The author calls attention to a report by Brugsch, who noticed an increase of myelocytes in the blood following injection of epinephrine in course of myeloid leukemia. The reaction observed indicates a special reactivity of lymph nodes, suggesting that the disease has its point of attack in the lymphatic tissue. A review of literature on the clinical characteristics and etiology of Hodgkin's disease with his own observations convinced the author that Hodgkin's is not caused by a specific micro-organism or virus, but that various organisms, their toxins or waste products of metabolism are the exciting factors. Special reactivity of lymph nodes appears to be essential for the development of Hodgkin's disease.

Gann, Tokyo

35:1-63 (Feb.) 1941. Partial Index

- *Decomposition of Dipeptides by Carcinoma Serum. S. Ura.—p. 29.

Dipeptide Decomposition by Carcinoma Serum.—Using the technic of Waldschmidt-Leitz and Mayer (1939), Ura presents a comparative study of serum from carcinoma patients and from normal subjects in the decomposition of dipeptides. The substrate was prepared by mixing *d,l*-leucylglycine (1.87 Gm.), normal ammoniacal ammonium chloride buffer (8 cc.) and normal acetic acid (1 cc.) in 100 cc. of distilled water. The test mixture consisted of 3 cc. of the substrate and 6 cc. of serum, and the reaction was allowed to proceed at 30 C., pH 8.0; the degree of decomposition was estimated on aliquots at twenty-four and forty-eight hours by titration with a tenth-normal potassium hydroxide solution in 98 per cent alcohol. The serums used in these studies were obtained from 41 patients with various types of carcinoma, 19 normal subjects and 38 patients with noncarcinomatous diseases. The author records the results of his observations as follows: (1) The decomposition power of serum from normal subjects on *d,l*-leucylglycine varied greatly, ranging at forty-eight hours from a maximum of 73.3 per cent to a minimum of 13.4 per cent, with an average of 41.9 per cent; (2) the serums of noncarcinomatous patients showed relatively uniform results, with approximately 40 per cent decomposition at forty-eight hours; (3) the serums of carcinoma patients exhibited a higher decomposition rate (from 13 to 29 per cent) than those of noncarcinomatous patients, the average being 53.3 per cent, with a maximum of 69.1 per cent in a case of the carcinoma of the esophagus and a minimum of 50.8 per cent in a case of the carcinoma of the mammary gland. In advanced cases of malignancy the rate of decomposition was high, although in individual cases the rate on the whole was surprisingly constant. In early cases surgical removal of the primary growths resulted in restoration of the dipeptide decomposition power of the serum to a nearly normal level. These results support the theory of Waldschmidt-Leitz and Mayer,

who maintained that, owing to the presence of a peptidase in carcinoma serum as in contrast to normal serum, the former is capable of splitting over 50 per cent of racemose peptide (*d,l*-leucylglycine, *d,l*-glutamyl-glycine, *d,l*-glutamyl-glycine-ethyl-ester). This characteristic behavior of carcinoma serum may thus be utilized for diagnostic purposes.

Arkiv Biologiskikh Nauk, Leningrad

60:1-96 (No. 2) 1940. Partial Index

- Phosphorus-Calcium Metabolism in Kashin-Beck Disease. N. V. Boldirev, E. D. Vishepan and S. M. Bychkov.—p. 11.
Experimental Skin Tuberculosis Under Conditions of Neurodystrophy: Disturbances. A. I. Belousova.—p. 21.
*Preparation of Complete Antigen for Active Immunization Against Spring-Summer Encephalitis. E. N. Levkovich and A. A. Smorodintsev.—p. 56.
Experimental Data on Distribution of Virus of Autumn Encephalitis in Organism of White Mice and Rats. V. D. Neustroev.—p. 66.

Antigen for Active Immunization Against Spring-Summer Encephalitis.—Levkovich and Smorodintsev, working in the Department of Filtrable Viruses of VIEM, Moscow, demonstrated that formaldehyde in 1:500 or 1:750 concentration kills the virus of the spring-summer encephalitis when incubated for twenty days at refrigerator temperature, for six days at room temperature and for three days at a temperature of 37 C. Mice inoculated with this vaccine are immune to injection of 100 lethal doses of the virus. The antigenic and immunogenic properties of the formaldehyde killed virus do not change on incubation in the refrigerator for at least two months. Vaccine prepared from the nonclarified brain emulsion of the virus possesses higher antigenic properties than that prepared from the clarified virus. The utilization of heterogeneous tissue for the preparation of the vaccine does not alter its immunogenic properties. The vaccine prepared from the human brain proved as effective with regard to white mice as that prepared from the brain of mice infected with the virus. Virus killed by phenol, heat or ether does not show any antigenic activity. To obtain effective vaccines it is necessary to observe optimal correlation between the concentration of formaldehyde, the temperature and the time of contact with the virus.

Acta Orthopaedica Scandinavica, Copenhagen

11:129-342 (Nos. 3-4) 1940. Partial Index

- Treatment of Congenital Clubfoot, Especially the Relapsing Cases. P. G. K. Bentzen and E. Thomsen.—p. 129.
Experiences with Operative Treatment of Inveterate Clubfoot in Older Children and Adults. H. Støren.—p. 135.
"Protruding Disks" in Lumbar Region. S. Friberg.—p. 138.
Palliative Subtrochanteric Osteotomy: Reexamination of Forty-Three Patients Treated in Cripples' Hospital, Copenhagen, in Period of 1926-1935. S. Franck and S. Klær.—p. 153.
*Fate of Poliomyelitic Patients of 1937 in Copenhagen. A. Monberg.—p. 184.
Apparatus for Firm Apposition of Resectional Surfaces in Intra-Articular Arthrodesis. A. Hellstadius.—p. 190.

Fate of Poliomyelitic Patients.—Monberg discusses the residual disabilities of 101 patients discharged to their homes one and a half to two years previously for further treatment of their paralytic poliomyelitis whose acute attack was sustained in 1937. During 1937 there were also 25 patients who died during an acute attack of the disease and 61 who had poliomyelitis of a nonparalytic form. The surviving 101 patients with the paralytic form were divided into three groups: (1) mild, patients who are functionally well as the paralysis has subsided completely or merely left some slight defects of little inconvenience to ordinary physical activity; (2) moderate, patients whose functional capacity is lowered so that in order to earn their living or to do ordinary housework they must wear a supporting bandage or in whom transplantation of muscles or fixating operations on bones or joints were necessary to obtain stability of the paralyzed back or extremity, and (3) severe, patients disabled to such an extent that they are invalids in the legal sense of the term. On reexamination 58 cases are reckoned as mild, 24 as moderate and 19 as severe. Reexamination shows that the case mortality for the total material was 13.4 per cent and that complete disability in the legal sense of the term was the result in 10.2 per cent, while the remaining 76.4 per cent of patients were either fully restored or able to earn their living by working after treatment with stabilizing operations or supporting bandages.

Book Notices

Emergency Surgery. By Hamilton Bailey, F.R.C.S. Surgeon, Royal Northern Hospital, London. Fourth edition. Cloth. Price, \$15. Pp. 944, with 930 illustrations. Baltimore: William Wood & Company, 1940.

That Hamilton Bailey's book has passed through three editions and two reprints since its appearance in October 1930 bespeaks of the favor with which it has been accepted by the profession at large. The fourth edition has been extensively revised because "a number of remarkable changes in the management of urgent surgical conditions have taken place." In brief the book deals, as one would expect from the title, with that branch of surgery in which the stricken patient requires immediate or urgent surgical intervention. The author treats the subject, as he says in the introduction, from the attitude "of a comparatively isolated surgeon called upon to carry out appropriate treatment." As a matter of fact the text is extremely comprehensive and in a remarkably able manner covers the subject of emergency surgery from almost any standpoint. The text is clearly printed and the material arranged in such a way as to be readily accessible. The numerous illustrations are well selected and help materially in explaining the text. The reviewer can well understand the popularity of the book and recommend it to all who are called on to treat emergency surgical patients. The subject of uncomplicated fractures is not considered.

Atlas of Electroencephalography. By Frederic A. Gibbs, M.D., and Erna L. Gibbs. Cloth. Price, \$7. Pp. 221, with illustrations. Boston: The Authors, Boston City Hospital, 1941.

The medical reader who opens a book and realizes that a long hidden mystery of the human body stands revealed experiences the sort of thrill which must have chilled the spines of Columbus and Magellan when they first looked on unexplored lands. The brain is the most intricate and important organ in the body, and the most securely protected. But electrical science has opened doors of understanding which would never yield to the scalpel or the microscope. The success of this modern adventure is set forth in Dr. and Mrs. Gibbs's book.

The idea of a voyage over uncharted seas is suggested by the body of the book, 104 pages filled with undulating lines. These are life-sized reproductions of tracings of the electrical waves which arise in the cortex of normal persons and of patients. Sample tracings are given of normal persons of various ages and under various physiologic conditions. Pages are devoted to abnormal tracings from relatives of the epileptic and from other supposedly normal persons and also from patients with various complaints related to the central nervous system—epilepsy, hemiplegia, cerebral arteriosclerosis, meningitis, multiple sclerosis, chorea, narcolepsy, migraine, psychosis, dementia paralytica, hyperthyroidism, behavior disorders and so on. The method of localization of cerebral lesions is explained and illustrated. A thumbnail case history accompanies each tracing.

Because the technic of electroencephalography is subject to many artefacts, and interpretation of records, like the interpretation of roentgenograms, requires experience, this atlas is absolutely indispensable for any one proposing to work in this field. It explains the technic of making records and the various pitfalls to be avoided. However, the atlas is much more than a technician's manual. It opens with an unselfish tribute to Hans Berger, reviews the history of the new technic and discusses present knowledge of the significance of brain waves. Important to workers is the bibliography of some six hundred references to electroencephalography which have already appeared in medical literature. The atlas does not cover the Grass-Gibbs method of the electrical analysis of records. The addition of this subject sometime in the future would be reason for a new edition.

The desirability of reproducing tracings which are unreduced in size and of sufficient length makes the book unconventionally large: 12 by 15 inches and over 6 pounds in weight. It is too large for the ordinary shelf. Like the anatomic atlases of Vesalius, the volume will be treasured none the less. Not the least accomplishment is the price, which is only the cost of printing.

Klinika eksperimentalnogo B-avitaminoza. [By] M. S. Levinson. [Clinical Aspects of Experimental Avitaminosis B.] Paper. Price, 13 rubles. Pp. 248, with illustrations. Rostov on Don: Rostovskoe Oblastnoe Knigoizdatel'stvo, 1939.

The monograph reports a study whose aim was to trace in animal experiment the clinical course of the B complex avitaminosis from its earliest manifestations to its final stage. The first part of the monograph consists of a comprehensive historical review of the discovery of vitamins, a discussion of the present status of the chemistry of vitamin B, its synthesis, physical and chemical properties, the interrelationship of vitamins, hormones and ferments, and the present status of the question of symptom complex of avitaminoses. The author studied the clinical picture of B avitaminosis in 9 dogs and 60 pigeons. Simultaneous control chronic starvation experiments were carried out on 3 dogs and 10 pigeons. After careful observations for a period of two months, the 9 normal young dogs were placed on a diet from which all thermolabile and some of the thermostable components of vitamin B complex were carefully excluded. This was accomplished by autoclaving the food for four to five hours at a temperature of from 120 to 125 C. Cod liver oil and lemon or orange juice were added to supply vitamins A and D and C. Careful clinical and laboratory observations, supplemented by gross and microscopic postmortem studies, suggested to the author that the clinical picture of B avitaminosis is primarily dependent on changes in the metabolism of the animal and its neuroendocrinologic imbalance. Among the more characteristic symptoms noted were loss of weight, change in the appearance of the feces, loss of appetite, vomiting, loss of heat, motor and sensory disturbances, cutaneous lesions and change in the behavior. The author appreciates the fact that avitaminosis is not the cause of any disease per se but that it prepares the soil for it. The problem for the physician is to recognize the earliest manifestations of avitaminosis, their relationship to certain diseases which follow them, and their treatment while they are still reversible. This is a worth while contribution because of the carefully planned and rigidly controlled observations. A fairly extensive bibliography completes this interesting monograph in Russian.

Acute Response of Guinea Pigs to the Inhalation of Ketone Vapors. By H. Specht, Associate Research Physiologist, J. W. Miller, Pathologist, P. J. Valaer, Junior Chemist, and R. R. Sayers, Senior Surgeon. From the Division of Industrial Hygiene, National Institute of Health. Federal Security Agency, U. S. Public Health Service. National Institute of Health Bulletin No. 176. Paper. Price, 15 cents. Pp. 66, with 39 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1940.

This small publication is one of a long series that has continued over several years concerned with the dangers of industrially used volatile solvents. This particular study is concerned with eleven ketones, of which acetone (dimethyl ketone) is the best known representative. To the vapors of these several substances, in varying concentrations, guinea pigs were exposed under well controlled conditions. Injurious actions were regularly encountered in direct proportion to the concentration of the inhaled vapor, in relation to exposure time and, in the case of homologous straight chain methyl ketone, the probability of injury with relation to the number of carbon atoms present. Irritation of the nasal mucosa, which precedes more damaging effects, is regarded as providing some warning properties during the inhalation of these ketones. In this entire series of publications, observations have been made only to acute responses to comparatively high concentrations of the volatile solvents. Commonly the concentrations employed exceed those likely to arise in actual industrial exposure. In the acetone experiment, exposures were provided to 1, 2 and 5 per cent of vapors by volume. Translating this into parts per million, 2 per cent becomes 20,000 parts per million, which quantity may be little anticipated in open industrial areas. No information is available from these studies as to possible damage from much lower concentrations associated with long periods of exposure represented by weeks and months. In view of the use of some ketones in military and naval materials, this publication is doubly valuable because of its timeliness.

The Role of the Liver in Surgery. By Frederick Fitzherbert Boyce, B.S., M.D. Awarded the Quinquennial Samuel D. Gross Prize for Research in Surgery by the Philadelphia Academy of Surgery in 1940. Cloth. Price, \$5. Pp. 365, with 44 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1941.

This monograph was awarded the quinquennial Samuel D. Gross prize for research in surgery by the Philadelphia Academy of Surgery in 1940. The author emphasizes the concept that the liver is important in surgical conditions and substantiates it with personal research work. He brings out the idea that various individuals have a "hepatic weakness" and are liable to "liver deaths" following any type of surgery. The first chapter of the monograph deals with classification, reports of experimental observations and the evolving of the author's concept of the hepatorenal syndrome. Liver function tests are critically evaluated. The author's vast experience with the Quick hippuric acid test is reported. Results in health and the effects of anesthesia, postoperative states, biliary tract disease, thyroid disease and other conditions are given and elaborated on. A large chapter is devoted to the role of the liver and jaundice in hemorrhagic diathesis. This is an excellent summary of the historical background and the present status of the entire subject. The various tests are evaluated and discussed, and the author makes an eloquent plea for more frequent use of the serum volume index, a test which can be made with a minimum of laboratory equipment and which checks favorably with the results obtained by the more elaborate Quick prothrombin time determination. The practical point emphasized throughout is the existence of the "hepatic weakling," persons with much reduced hepatic reserve. These people are poor surgical risks, and the author believes that liver function tests should become as much a routine preoperative procedure as urinalysis in order that proper preoperative preparation may prevent catastrophes. The monograph is an excellent presentation, and its many practical points make it deserving of wide circulation among the profession. It is worthy of study by internists, general practitioners and pediatricians as well as by surgeons.

Notter & Firth's Hygiene. Revised by L. C. Adam, M.B., B.S., Assistant Medical Officer, Public Health Department, London County Council, London, and E. J. Boome, M.B., Ch.B., M.R.C.P., Principal Assistant Medical Officer, Public Health Department, London County Council. Tenth edition. Cloth. Price, \$3.50. Pp. 518, with illustrations. New York, Toronto & London: Longmans, Green & Co., 1940.

Since this work was last revised in 1921, the present edition has required the addition of much new material. Furthermore, certain parts of the original text have been deleted, although the material of historical interest has been retained. In England new legislation, such as the Public Health Act of 1936, the Housing Act of 1936 and the Food and Drug Act of 1938, has had a distinct influence in social conditions and a description of these acts is included in the text. The early chapters deal with air, water, food, soils, refuse and excreta disposal, and personal hygiene. There is also included material on speech and its disorders, oral hygiene, first aid, vital statistics and the climate and weather. While an attempt has been made to bring the book up to date, recent discoveries are not always included. For example, vitamin B₂ is considered as the pellagra-preventive factor. The prevalence of impetigo contagiosa in newborn nurseries is not mentioned. The value of immune globulin in measles receives no notice. In general, however, the material in the book should be of interest to physicians, nurses and all others interested in public health.

The Care of the Psychiatric Patient in General Hospitals. By Franklin G. Ebaugh, M.D., Director, Colorado Psychopathic Hospital, Denver. Official Bulletin No. 207. Cloth. Price, \$1. Pp. 79. Chicago: American Hospital Association, 1940.

The author has spent much time in surveying and encouraging psychiatric education in the universities. This brochure is a result of his contemporary interest in psychiatric care of patients in general hospitals, and it clearly indicates the present trend. The advantages of caring for psychiatric patients in hospitals where the assistance of medical, surgical and laboratory services can be called on are obvious. Ebaugh outlines various types of hospital organizations and lays down general principles of management. Examples of existing psychiatric units are given as well as estimates of costs which are

extremely inaccurate and much too low. The book is useful primarily for the arguments included in the first chapters. In them the author has written a concise and convincing document which can be used to advantage in convincing hospital administrators and hospital directors of the need and wisdom of psychiatric services and units in general hospitals.

Communicable Diseases. By Nina D. Gage, A.B., M.A., R.N., Superintendent of Nurses, Newport Hospital, Newport, R. I., and John Fitch Landon, A.B., M.D., Attending Physician, Willard Parker Hospital, New York. With the collaboration of Grace M. Longhurst, R.N., Superintendent of Nurses, Mount Morris Tuberculosis Hospital, Mount Morris, N. Y., and George F. Hoch, A.B., M.D., Associate Urologist, St. Luke's Hospital, New York City. Second edition. Cloth. Price, \$3.50. Pp. 411, with 40 illustrations. Philadelphia: F. A. Davis Company, 1940.

Based on the premise that the nursing of communicable diseases is a specialty, this book has been prepared to aid in the education of competent communicable disease nurses. Since it is essential that such nurses be thoroughly familiar with both the theory and the practice of this specialty, the book includes descriptions of the course of the various communicable diseases and the methods of treatment. In addition, the general principles underlying medical asepsis and technic are amply stressed. In this edition revisions have been made in keeping with the advances which have occurred in the therapy of communicable diseases. A chapter on sulfanilamide and its derivatives has been added. The volume is well illustrated and constitutes an admirable textbook for the nurse desirous of increasing her knowledge of the communicable diseases.

Znachenie golovnogo mozga v kholesterinovom obmene (k voprosu o roli neyroglii v patogeneze kholesterinemii). [By] P. D. Gorizontov. [Role of Brain in Cholesterol Metabolism (Role of Neuroglia in Pathogenesis of Cholesterolemia)]. Paper. Price, 7 rubles, 50 kopecks. Pp. 131, with illustrations. Moscow: Izdanie Pervogo Moskovskogo Meditsinskogo Instituta, 1940.

Gorizontov produced aseptic meningococcalitis in dogs by subdural injection into the brain of either turpentine or silver nitrate. The comparative study of the blood cholesterol of the afferent arteries of the brain and of the blood cholesterol level of the efferent vessels of the brain demonstrated the development of hypercholesterolemia in the experimental animals. This could not be explained on the basis of mobilization of cholesterol from the lipid depots of the brain; the author interprets it as the result of the increase of cholesterol synthesis in the brain. He correlated the various biochemical data obtained in his experiments with the morphologic alterations in the brain of the same animals and established the dependence of the blood cholesterol levels in his animals on the reactive processes of the ectodermal neuroglia cells of the brain. In the light of the view advanced by the author, the role of neuroglia in cholesterol metabolism is that of a detoxifying process; toxic brain lesions themselves may be regarded as the result of disturbance of metabolic function of the neuroglia. Thus, hypercholesterolemia as a result of hyperfunction of the neuroglia cells of ectodermal origin plays an important part in the lesions of internal organs, as for example in the development of atheromatosis of the aorta and of the arteries. The monograph is in Russian, with a brief summary in German. It is supplemented by an extensive bibliography on the subject.

Special Report of the New York State Commission to Formulate a Long Range Health Program on Health Mobilization for Defense. Legislative Document (1941) No. 43. Paper. Pp. 64. Albany, 1941.

Any emergency that focuses the emotions and attention of a nation on a single objective finds a multitude of ideas, individuals and organizations seeking to hitch this emotional energy to diverse programs. It is futile to criticize such a tendency, and it is hard to measure its results. The problems this commission sets itself involve almost everything that concerns health in war or peace from "forming of mobile emergency squads of physicians, surgeons and nurses capable of being immediately transported to any area experiencing a catastrophe" to the "prevention of panic among the civilian population." For this purpose the familiar pattern of a "central agency" with committees in every county representative of all health agencies is suggested. These committees are to determine and evaluate the "health resources in each county," which work, when completed, is to provide the official authorities "with a blueprint of the health facilities in each county."

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ALTITUDE AND HEART DISEASE

To the Editor:—I would appreciate information on the effect of high altitudes on cardiac patients. The patient in mind has arteriosclerotic heart disease and complains only of dyspnea on moderate exertion. On one occasion he awoke during the night choking for breath. This episode cleared up in about a half hour without medication. The patient desires to move from this part of the country and to settle in Arizona (southern portion) or New Mexico. Is the altitude in these locations suitable for the type of patient described? If there are any specific locales where this can be obtained, I should like to know of them even if they do not happen to be in the states mentioned.

M.D., Illinois.

ANSWER.—The essential point in the problem of the case cited is not that of the effect of altitude but that of the treatment of this condition at any altitude. From the story it seems certain that there is a markedly limited myocardial reserve especially involving the left ventricle, provided the chief symptom is dyspnea and not substernal pain. It is of vital importance, therefore, to plan the life of the patient to avoid the strain of overactivity, nervous tension and overeating. He is evidently good for but little under the circumstances and needs almost complete rest until he has recovered adequate reserve. Even more important is his need of digitalis. He should be digitalized in a conservative way, and the digitalization should be maintained thereafter by daily rations. He may take $1\frac{1}{2}$ grains (0.1 Gm.) of the old strength digitalis three times a day for five to seven days, then $1\frac{1}{2}$ grains daily thereafter, or he may take similar numbers of 1 grain (0.65 Gm.) doses of the U. S. P. XI standard, which is 33 to 50 per cent stronger than the old digitalis. If these measures are not effective in preventing any further failure he should also receive at intervals diuretic therapy, best in the form of mercurials. Life can be much prolonged and made more comfortable by the measures just cited, no matter what the altitude is, although it would be reasonable to advise that altitudes of 10,000 feet or more be avoided and that effort in hilly country also be avoided at any altitude. If the measures of treatment outlined are carried out there is no particular reason why the patient should not settle in Arizona or New Mexico.

SURGICAL RELATIONS OF BLADDER, URETERS AND UTERUS

To the Editor:—Operation on a cystocele has progressed to the following point: The bladder has been separated from the vaginal wall and the uteropubic fascia, but the fascia has not been separated from the vaginal wall; the bladder has been separated from the uterus for a distance at 1 cm. Under such conditions, please inform me as to the following: 1. While the operator is working, where, in relation to the structures he observes, do the ureters lie and enter the bladder? 2. In freely continuing the stripping up of the bladder using scissors to cut (bands) along the lateral region involving this work, what danger is there, if any, of injuring the ureter? 3. If the separation of the bladder from the uterus continues, in practically all cases a round cordlike structure presents which seems to arise at the side of the cervix at the level of the internal os and swings up on to the bladder. Could or does this structure contain the ureter? I feel that many operators in general practice are hampered in this operation for fear of injuring the ureter. If reasonable care is used, is there any danger of this? I would appreciate it if these questions were answered from the standpoint of surgery rather than that of normal anatomy.

M.D., Minnesota.

ANSWER.—1. The ureters enter the bladder obliquely convergent, ensheathed in extensions of the musculofascial covering of the bladder. They are approximately 5 cm. apart as they approach the bladder before entering it, and they lie farther apart at a higher level.

2. The bands referred to are evidently the pillars of the bladder. In normal cases the ureters are 1 cm. lateral to the pillars. In cases of cystocele they lie still more lateral.

3. In generously wide separation of the bladder from the uterus there is little danger of ureteral injury—much less hazard of ureteral injury in a cystocele operation than in an abdominal complete hysterectomy.

For the relationships of the ureters to the bladder, to the fascial planes and to the uterus, reference is made to Curtis, Anson and Beaton: *The Anatomy of the Subperitoneal Tissues and Ligamentous Structures in Relation to Surgery of the Female Pelvic Viscera* (*Surg., Gynec. & Obst.* 70:643 [March] 1940), particularly figures 6 and 7.

ENLARGED BREASTS AND IMPOTENCE IN MAN

To the Editor:—A man aged 41, with a normal post history, was essentially well up to seven years ago. His only complaint now is moderate impotence. He completes the sexual act once weekly but not with the same sexual satisfaction as formerly. There is a great reduction in the sexual urge. The sexual urge and power were good until seven years ago, at which time the patient noticed a sudden enlargement of both breasts. Both breasts continued to enlarge for several months up to the size of small grapefruits, at which size they have remained. All physical examinations and blood tests gave negative results. A roentgenogram of the sella turcica also revealed no abnormalities. The only treatment to which the patient responded was injections of testosterone propionate, which he received twice weekly for five weeks, but the improvement was only temporary while he received these injections. Kindly discuss diagnosis and treatment.

M.D., New Jersey.

ANSWER.—In general, it should be remembered that in the majority of cases impotence has its origin in a psychic disturbance of some sort and that great care should be exercised in interpreting the improvement which follows any "specific" treatment. Many patients who report improvement in their sexual abilities following injections of hormones improve just as much after injections of sterile oil or sterile water and may improve more from a good vacation.

In preface, it also should be remarked that not every man who has enlargement of the breasts is suffering from a serious glandular disturbance; in many instances the cause remains unknown, the treatment is unsatisfactory but the prognosis for life is good.

If a localized inflammatory or neoplastic condition of the breast has been eliminated in this case (Neal, M. P., and Simpson, B. T.: *Diseases of the Male Breast*, *J. Missouri M. A.* 27:565 [Dec.] 1930. Charache, Herman: *Tumors of the Male Breast*, *Surgery* 7:889 [June] 1940), comparatively few serious conditions remain to be considered. It is unlikely that this patient has had a tumor of the adrenal cortex for seven years; most patients with such a condition "run a rapid course." Furthermore, it would be unusual to have this condition occur in a man; to date only 8 proved cases of adrenal cortical tumors in males have been reported. This subject has been reviewed by Kepler (*Tumors of the Suprarenal Cortex*, *Basophilic Tumors of the Pituitary Body and Allied Diseases*, in the *Cyclopedia of Medicine, Surgery and Specialties*, Philadelphia, F. A. Davis Company, 1939); he cited the many other obvious disturbances which are usually found when a tumor is present.

If this patient has an adrenal cortical tumor he should have, in addition to impotence and changes in the breast, changes in the skin, peculiar obesity, hypertension, glycosuria and hyperglycemia, increased concentrations of the chlorides and sodium in the blood, increased carbon dioxide combining power of the blood, lowering of the amount of potassium in the blood and so on. Hormone assays should be made. These methods are described by Simpson and his associates (Simpson, S. Levy; deFremery, P., and Mac Beth, Alison: *The Presence of an Excess of Male [Comb-Growth and Prostate-Stimulating] Hormone in Virilism and Pseudohermaphroditism*, *Endocrinology* 20:363 [May] 1936. Simpson, S. Levy, and Joll, C. A.: *Feminization in a Male Adult with Carcinoma of the Adrenal Cortex*, *ibid.* 22:595 [May] 1938) and by Glass and Bergman (*Subclinical Adrenogenital Syndrome*, *ibid.* 23:625 [Nov.] 1938).

An intravenous urogram should also be made in this case further to exclude the possibility of an adrenal cortical tumor.

Minor degrees of gynecomastia have been noted in the newborn, in the presence of exophthalmic goiter, in patients with Addison's disease under treatment and among growing boys and patients suffering from atrophic cirrhosis of the liver and hemochromatosis.

After a surgical lesion of the adrenal cortex has been excluded, the breasts may be removed in order to eliminate any possibility of a malignant lesion developing at a later date and because of the psychic effect. Another reason which is probably just as important as either of these is that amputation will permit the patient's clothes to fit and he will be able to appear in a bathing suit without embarrassment.

Androgenic therapy is effective in cases in which there is definite organic disease of the testes. It is of little use in psychic or senile impotence. When administered to castrated or eunuchoid persons, testosterone propionate is effective in restoring potency, but this lasts only as long as therapy is maintained, since it is purely substitutional. The fact that the patient responded to injections of testosterone propionate might indicate that he actually has a deficiency of secretion of male sex hormone. Occasionally such a condition results in enlargement of the breasts.

CHRONIC NEPHRITIS IN EARLY CHILDHOOD

To the Editor:—A boy aged 5 years has been ill for the past five and one-half months. His illness began with a gradual loss of strength, with increasing edema, until generalized anasarca had developed. When I first saw him, his weight was 90 pounds (41 Kg.), his normal weight being 45 pounds (20 Kg.). The urine contained albumin (4 plus), hyaline and granular casts and an abundance of blood. His urinary output for the past four days had averaged 4 to 5 ounces (120 to 150 cc.). An abdominal paracentesis yielded about a half gallon (2 liters) of clear fluid. Treatment with transfusion, serum and concentrated dextrose resulted in an increased urinary output, as high as 40 ounces (1,200 cc.) daily. There was a reversal of the albumin-globulin ratio. I have followed the case for about two months. The urinalysis has not varied much from that given. The output gradually decreases to about the average of 8 to 10 ounces (240 to 300 cc.) daily, with an average intake of 25 ounces (750 cc.). The edema and ascites, of course, gradually increase. Intravenous administration of a 50 per cent solution of dextrose has no effect on the urinary output. I recently resorted to acacia, 50 cc. in 200 cc. of distilled water, once daily for three days. This resulted in diuresis amounting to 40 ounces of urine daily, gradually decreasing to 10 ounces on the average. Anemia is severe despite large doses of iron. Blood transfusions are numerous, of necessity. The boy seems to feel good and would like to be up and playing. Have you any suggestion as to treatment and prognosis?

M.D., Texas

ANSWER.—The description is typical of chronic diffuse nephritis or, perhaps better, chronic nonspecific nephritis, because this term implies that the cause is unknown. The usual course of events in patients with this sort of disease is intermittently downhill with edema which is extremely hard to control under the most favorable conditions. However, the prognosis is not absolutely bad because if life can be maintained for a year or so during this edematous phase of the disease there is a possibility that patients with this condition may "go dry" and be free from the distressing anasarca.

In the meantime such patients may be placed on a high protein, salt-free diet, along with as many fluids as they desire. Available diuretics do not work consistently. If the patient has a low basal metabolism, it is sometimes helpful to use thyroid in large doses. One would not repeat the administration of acacia because acacia is not excreted and is stored in the liver, there being some possibility that hepatic damage may result.

While ordinarily the prognosis for such a patient is bad at this age period, it may be said that if the patient can be carried through the edematous phase into the dry period his chance of recovery is better than it would be in an older child. This is because many patients with this condition are adversely influenced by adolescence.

CYST OF SCALP IN INFANT

To the Editor:—A baby girl aged 11 months has a cyst 3.2 by 3.5 by 0.75 cm. lying under the scalp in the median line covering the forward crevice of the anterior fontanel. The cyst has a definitely circumscribed circular border and is filled with a light colored translucent fluid (as indicated by the transmission of light, lighter colored than blood usually appears. Pressure does not seem to reduce the quantity of fluid, but it causes distress and pain if pressure is increased. When the child accidentally struck the cyst with her bottle, she fainted, until the mother sprinkled her face with cool water. The cyst was first discovered and examined when she was 5 months old. It was then about 2 cm. in diameter and 2 or 3 mm. in depth and has been gradually increasing in size since. The child's reflexes are normal, as also her mental and physical development. She is the first child of healthy young parents. The Wassermann reaction is negative. She had a normal, easy birth and has had normal development since. For a few months after birth she had a small area of scalp slightly elevated at the vertex, on which a succession of small herpes blisters developed and broke. Gradually the skin healed and now is normal. This appears to me to be a meningocele rather than a sinus pericranii with a content of venous blood, as suggested by some one. From this description can you make a probable diagnosis and prognosis and suggest proper treatment?

M.D., Wisconsin.

ANSWER.—A differential diagnosis is necessary to determine the nature of the cyst of the scalp described in this question. The most common tumors of the scalp are the sebaceous cysts or wens. These cysts develop as a result of the plugging of the duct of a sebaceous gland. They lie primarily in the dermis and extend into the subcutaneous tissue but do not as a rule involve the galea. The skin over such a cyst may become stretched and thin and often has a bluish appearance.

Dermoid cysts develop at lines of suture and are more deeply seated than sebaceous cysts. On roentgen examination thinning of the bone may be observed, and the cyst may lie in contact with the dura. Dermoid cysts may contain epithelium, hair or cutaneous glands.

Angiomas of arterial, venous and capillary origin may occur on the scalp. At times these tumors of blood vessels are connected with diploic vessels or the meningeal arteries.

The condition described by Stromeyer as sinus pericranii is in reality nothing more than a greatly dilated vein and is seen only in conjunction with tumors of the brain.

Spurious meningocele, which was first described by Billroth, is a term applied to collections of cerebrospinal fluid under the scalp but external to the cranium and dura. In all instances of this condition there is some history of trauma.

Cephaloceles may be divided into meningoceles, encephaloceles and encephalocystoceles. These lesions are present at birth and are soft in consistency. They pulsate and become tense when the child cries. If the tumor is compressed, compression symptoms may be produced: the crying child will become quiet, the pulse will become slow and the pupils dilated. The congenital nature of these tumors usually assures the diagnosis.

In the case in question it is stated that the tumor was not noted until the infant was 5 months of age. It might be suggested that the history be carefully investigated as to the presence of the tumor since birth.

The dermoid cysts most commonly occur in the neighborhood of the anterior fontanel. They are irreducible and are of a doughy consistency on palpation. Roentgen examination of the skull should reveal involvement of the bone. Tumors of blood vessels usually show pulsation.

Prognosis would depend on the proper diagnosis and the dexterity of the surgical removal of the cyst, if this procedure seemed indicated.

PERORAL AND INTRAVENOUS CHOLECYSTOGRAPHY

To the Editor:—Would you give me the following information about intravenous cholecystography: First, can this procedure be used solely in all cases in which the peroral method is not suitable or in which the peroral method does not produce any shadow of the gallbladder? Second, where can I procure the materials for this cholecystography, and what maximum dose do you recommend? Third, do you believe that in a certain number of cases the intravenous method can give positive results when the peroral method fails to do this even after double doses?

H. B. Eisenstadt, M.D., Port Arthur, Texas.

ANSWER.—There are two agents in common use for cholecystography: soluble iodophthalein U. S. P. and phenetiothalein sodium. The latter substance, according to New and Nonofficial Remedies, is better suited for intravenous injection. The intravenous injection of soluble iodophthalein may be safely used for cholecystography to check the results obtained by the oral method of administration of the dye. The intravenous technic is used routinely for cholecystography in many clinics. Preparations of soluble iodophthalein accepted by the Council on Pharmacy and Chemistry are supplied by the Abbott Laboratories, the Eastman Kodak Company and the Mallinckrodt Chemical Works. The Mallinckrodt Chemical Works supplies the only brand of phenetiothalein sodium accepted by the Council. Directions for dosage are given in New and Nonofficial Remedies. It is true that in a small number of cases shadows will be seen following the use of the intravenous method although the oral method will not give results.

DERMATITIS FROM SULFATHIAZOLE

To the Editor:—Is photosensitization to sulfathiazole considered a contraindication to future employment of this drug?

Edward Suckle, M.D., Coatesville, Pa.

ANSWER.—Sulfathiazole, of all the sulfanilamide derivatives, seems to be the drug which has the greatest percentage of instances of dermatitis associated with its use. Experience has shown that if a patient has once had a "drug rash" in the course of sulfathiazole therapy, irrespective of whether or not the eruption was associated with photosensitivity, the second administration of the drug will generally be followed by a somewhat more severe rash than occurred the first time the drug was given. While this occurrence is not invariable, it has been noted so frequently that the development of a cutaneous rash in the course of sulfathiazole therapy is generally considered a contraindication to the further use of the drug.

TUBERCULIN IN THERAPY OF OCULAR DISEASE

To the Editor:—A patient with hemorrhagic choroiditis has been given tuberculin for therapy. I began treatment with tuberculin R ("Rick-stand"), Mulford. This preparation has been discontinued by Sharpe & Dahme. I should like your opinion as to the best preparation I might use in its stead.

M.D., New York.

ANSWER.—The best preparation to be used instead of tuberculin R is what is known as Koch's old tuberculin. This product is obtainable in powder form, and dilutions of varying strength should be made fresh at intervals of not longer than one month. It is important that a high dilution be used at the beginning of the treatment, especially when there is any activity of the tuberculous lesion present. It is advisable to begin with a dilution of 1:1,000,000 and gradually increase the concentration, it remaining always just below the threshold of reaction.

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PRIMARY MALIGNANT TUMORS OF BONE

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This study of 424 primary malignant tumors of bone encountered at the Mayo Clinic during the past quarter century (1909 to 1934) was undertaken in response to the invitation of the "Sociedad Argentina de Cirugia" to one of us to participate in a symposium. We have reviewed the records, clinical and laboratory observations, roentgenograms, pathologic characteristics, treatment and results of treatment. We have had the cooperation of the pathologists in classifying 361 (85 per cent) of the tumors in these cases and in grading the malignancy of most of them. By careful follow-up inquiry we have traced 98.3 per cent of 424 patients over a period of three years and 96.5 per cent of 371 patients for five years after examination and first treatment (table 1).

The practitioner of internal medicine rarely encounters primary malignant tumors of bone and is compelled to depend on large medical centers or on group studies for knowledge as to the value of different methods of treatment and of prognosis. Study of the literature reveals a considerable difference of opinion as to the value of methods of diagnosis, treatment and prognosis. After studying this series of cases, we feel that we are able to draw valuable conclusions.

We have divided the primary malignant tumors of bone into the following groups: (1) osteogenic sarcoma, (2) fibrosarcoma, (3) Ewing's sarcoma, (4) multiple myeloma, (5) giant cell sarcoma (malignant) and (6) malignant tumors of bone nonsurgically diagnosed as sarcomas without specification of type.

For accuracy we have separated those cases in which surgical operation permitted microscopic diagnosis from those in which the diagnosis was based on clinical and roentgenographic examinations. We appreciate that one of the principal aids in diagnosis and prognosis is the roentgenogram, for it reveals situation, size, structure, presence or absence of invasion of soft tissues and earliest evidence of metastasis. Physicians also must appreciate the value of a history carefully taken with regard to pain, rapidity of growth, duration of symptoms, trauma, pathologic fracture and previous treatment. However, clinical and roentgenologic diagnoses at times are dangerous, particularly if the fate of an extremity depends on such data. It is our practice to apply a tourniquet whenever possible and to remove

a small piece of tissue for microscopic corroboration of the clinical and roentgenologic diagnoses before carrying out radical surgical measures.

OSTEOGENIC SARCOMA

An osteogenic sarcoma is a malignant tumor which develops from tissue that is predestined to form bone-producing cells. Among the osteogenic sarcomas we include osteosarcomas, chondrosarcomas, osteochondrosarcomas, osteochondrofibrosarcomas and osteochondrofibromyxosarcomas. The foregoing denote the type of tissue that is predominant in the tumor. The terms "osteolytic," "sclerosing" and "medullary" have been largely discarded lately except to emphasize anatomic or roentgenographic features. However, the terms "periosteal fibrosarcoma" and "periosteal osteogenic sarcoma" still are employed to denote tumors which continue to be recognized. Periosteal fibrosarcomas probably arise from the outer portion of the periosteum or neighboring tissue. They may cause absorption of bone or later invasion, and these processes may give rise to the supposition that the growth is a primary tumor of bone. Periosteal osteogenic sarcoma apparently arises from the corticoperiosteal tissue and produces true bone.

In the study of osteogenic sarcoma it became obvious that such tumors are rare; the incidence was about 1 (0.00025 per cent) in every 4,000 patients who entered the clinic. In the period of twenty-five years covered, there were 216 cases of osteogenic sarcoma (table 2); this comprises 50.9 per cent of the total number of cases of primary malignant tumor of bone. In 187 cases tissue was available for microscopic verification at the time of the original diagnosis, and in the remaining 29 diagnosis was based on clinical and roentgenologic observations. There were one hundred and forty-six (67.6 per cent) males and 70 (32.4 per cent) females. The average age of the 216 patients was 29.3 years. The largest number of patients, about 40 per cent, were between the ages of 10 and 20, and 132, more than 50 per cent, were less than 30; the youngest patient was 3 years and the oldest 77 years.

In 96 (44.4 per cent) of the 216 cases there was a history of trauma as a possible factor, in 46 (21.3 per cent) trauma was denied and in 74 (34.3 per cent) there was no statement in the records as to whether trauma had occurred. The average duration of symptoms before the patients came to the clinic was ten and one-third months.

Seventy-five (34.7 per cent) of these 216 tumors occurred in the femur, 38 (17.6 per cent) in the tibia and 20 (9.3 per cent) in the ilium. In 154 cases (71.3 per cent) the tumor was in the extremities; in 48 (22.2 per cent) it appeared in the region of the knee joint. There were 12 cases of pathologic fracture, in 6 of which the humerus was concerned, in 3, the tibia

and in 1 each the femur, fibula and ilium. The tumors in the 187 surgical cases mentioned previously were reexamined histologically, and whenever possible the grade of malignancy was determined according to the method of Broders (table 3).

TABLE 1.—Primary Malignant Tumor of Bone: Three and Five Year Survival Rate According to Type of Tumor

Tumor	Patients Treated *	Patients Traced	Lived Three or More Years After Treatment		Patients Treated *	Patients Traced	Lived Five or More Years After Treatment	
			Patients	Percentage of Traced Patients			Patients	Percentage of Traced Patients
Osteogenic sarcoma....	216	212	66	31.1	191	182	37	20.3
Fibrosarcoma.....	38	38	13	34.2	36	36	11	30.5
Ewing's sarcoma.....	114	113	32	28.3	100	99	21	21.2
Multiple myeloma.....	41	39	3	7.7	31	28	1	3.6
Malignant giant cell sarcoma	7	7	6	85.7	6	6	5	83.3
Nonsurgical diagnosis of "sarcoma"	8	8	3	37.5	7	7	1	14.3
Total.....	424	417	123	29.5	371	358	76	21.2
		98.3%				96.5%		

* Inquiry as of 1933. The three year group comprises the patients treated three or more years prior to the time of inquiry, i. e., 1934 or earlier; the five year group comprises those treated in 1932 or earlier.

TREATMENT OF OSTEOGENIC SARCOMA

The method of treatment employed was not always the method of choice, because patients and relatives failed to follow the advice given and preferred to have the less mutilating procedures carried out. Estimation of the comparative value of the different methods of treatment constitutes one of the greatest problems of today. Our methods of treatment were (1) irradiation, (2) biopsy alone or combined with irradiation and sometimes with the use of Coley's toxins and (3) excision and amputation, with or without irradiation or administration of Coley's toxins. Not all osteogenic sarcomas are operable. The site, size and grade of malignancy of the tumor, the general condition of the patient and the presence or absence of pulmonary metastasis must be taken into consideration in determining the therapeutic measures best suited to dealing with the growth.

Expectancy of life and results of treatment are actually influenced by the grade of malignancy. Of the 187 cases in which tissue was available for microscopic verification at the time of the original diagnosis, in 120 (64 per cent) the malignancy of the tumors was graded. The five year survival rates are given in table 2. The larger survival rate in the presence of a tumor with malignancy of low grade agrees well with all studies made at the clinic concerning the significance, with respect to survival, of grading of malignancy in cases of malignant conditions of other tissues. It is justifiable to feel confident of the soundness of the general conclusion that in the presence of tumors of low grade of malignancy prognosis for five year survival is considerably better than it is in the presence of tumors of higher grades, even if the more conservative surgical measures are employed in treatment of the tumors of low grade.

Radium or Roentgen Therapy Without Biopsy.—Since 1920 the use of radiotherapy in selected cases has increased. The tendency has been to use multiple con-

verging beams, the quality varying according to the mass of tissue in which the tumor is situated. Preoperative irradiation, as now understood, has not been tried at the clinic; its field of usefulness is limited, and its indiscriminate use may be more harmful than beneficial. What is needed is early diagnosis, destruction or removal of the tumor and prevention of metastasis. Preoperative irradiation, since it consumes time, may permit metastasis. By force of circumstances, treatment has been almost entirely postoperative, some patients receiving part of their treatment at the clinic and part at home. No one but a radiologist who has had special experience in the treatment of these tumors should undertake to use radium or roentgen rays in these cases. By placing treatment in such hands, the danger of untoward results is diminished.

Of the 29 patients concerning whom diagnosis was made from clinical and roentgenologic examinations 28 received irradiation or irradiation and Coley's toxins combined; no surgical treatment was employed. Of these we have traced 27, and of the latter number only 2 (7.4 per cent) lived more than three years and none survived five years. Approximately two thirds of these patients died of metastasis in less than one year.

Coley's Toxins.—Of the 187 patients of whose tissues microscopic examination was available at the time of the original diagnosis, 184 were traced. Of these 184 traced patients some received Coley's toxins, and 40 per cent who did receive this treatment survived three years. Among those patients who did not receive Coley's toxins, 34 per cent survived three years. The five year survival rate among those patients who received Coley's toxins was 26 per cent, whereas that based on the patients who did not receive this treatment was 23 per cent. Although there is a slight

TABLE 2.—Osteogenic Sarcoma: Three and Five Year Survival Rate According to Type of Treatment and Histologic Grade of Malignancy

Treatment or Grade	Patients Treated *	Patients Traced	Lived Three or More Years After Treatment		Patients Treated *	Patients Traced	Lived Five or More Years After Treatment	
			Patients	Percentage of Traced Patients			Patients	Percentage of Traced Patients
Total group.....	216	212	66	31.1	191	182	37	20.3
Amputation.....	89	88	30	34.1	78	77	19	24.7
Excision.....	56	55	28	50.9	49	44	15	34.1
Irradiation †.....	68	64	8	12.5	50	56	3	5.4
No treatment.....	5	5	0	0	5	5	0	0
Surgical cases, graded								
Grades 1 and 2.....	56	56	24	42.8	45	43	11	25.6
Grades 3 and 4.....	64	64	12	19.0	55	54	8	14.8

* Inquiry as of 1933. The three year group comprises the patients treated three or more years prior to the time of inquiry, i. e., 1934 or earlier; the five year group comprises those treated in 1932 or earlier.

† With or without biopsy.

advantage in survival in favor of the patients who received Coley's toxins, it is difficult to evaluate the significance of this advantage. In the first place, only 25 patients received this treatment. Also, the treatment was carried out by their local physicians and we depended on their reports as to its administration. Moreover, the treatment as respects irradiation and surgical measures was not uniform in this group.

Biopsy.—On four patients biopsy alone was performed. In 2 of these the tumor was in the bony pelvis and the patients died seven and eighteen months after the specimen was taken. One patient had a tumor of a rib and died one month after biopsy; the tumor of 1 was in the upper part of the humerus and the patient died five months after excision of the specimen.

Biopsy is of value if there is any question as to benignancy or malignancy of a lesion of bone; it is of

TABLE 3.—*Osteogenic Sarcoma: Operations by Grade of Malignancy*

Grade	Total	Biopsy *		Excision †		Amputation	
		Number	Percentage	Number	Percentage	Number	Percentage
1	17	2	11.8	15	88.2	0	0
2	39	13	33.3	9	23.1	17	43.6
3	39	9	23.1	5	12.8	25	64.1
4	25	6	24.0	5	20.0	14	56.0
Not graded	67	12	17.9	22	32.8	33	49.3
Total..	187	42*	22.5	56†	29.9	89	47.6

* Thirty-three patients received irradiation also; 5 received irradiation plus Coley's toxins.

† Forty-four patients received irradiation also; 2 received irradiation plus Coley's toxins.

value, also, in making possible the grading of a malignant lesion. The experience of the pathologist is directly related to the value of biopsy. The surgeon must be certain that the material he submits to the pathologist is true tumorous tissue, and if the histologic diagnosis is not in agreement with his clinical opinion more tissue should be examined. As a rule the open operation is preferred in performing biopsy, for it permits inspection of the tumor and allows sufficient tissue to be obtained from a typical portion of the tumor. The tourniquet is employed whenever possible and every care is taken to minimize trauma to tissue. Taking of material for biopsy by means of a needle is useful if tumors are vascular and difficult of approach; some osteogenic sarcomas make such a procedure difficult. Biopsy and cooperation of a skilled pathologist are of inestimable value in clearing up the question of diagnosis; furthermore, grading of the degree of malignancy may alter the decision as to the type of treatment to be employed and as to prognosis.

Radium and Roentgen Therapy Following Biopsy.—The percentage of five year cures among traced patients who were treated by radiation after biopsy was 9.1. All such treatment was not carried out at the clinic, for it was necessary to cooperate with roentgenologists near the homes of some of the patients. Irradiation was employed because it was selected by the patient in preference to surgical treatment or because the size or situation of the tumor made its removal impossible. Regression of the growth and temporary improvement were noted in some cases, whereas atrophy of bone and soft tissue and stiffness of joints occurred in others. With further knowledge and development of irradiation, improved results may make it the method of choice, but our experience to date has indicated that osteogenic sarcoma is inadequately responsive to this form of treatment.

Excision.—Osteogenic sarcomas were excised in a great number of cases when the degree of malignancy was low, when the tumors were of such size and were so situated as to make amputation impossible or when the patient refused to have more radical procedures

carried out. When excision is performed in the early stages of the disease and the degree of malignancy is low, expectancy of life is increased and a functioning extremity may be preserved. Recurrence takes place, however, in spite of postoperative irradiation and treatment with Coley's toxins, and late amputation may be contraindicated because of metastasis. Complete excision of bone, followed by adequate irradiation, may result in extensive scarring; then reconstructive surgical treatment, such as bone grafting, may result in formation of ulcer, loss of the graft and, finally, amputation. Of the 44 patients treated by excision, with or without irradiation or administration of Coley's toxins, 15 (34.1 per cent) lived five years or more (table 2).

Amputation.—Consent to amputation is given by the patient or responsible relative only when the more conservative measures have failed or when the condition has become unbearable as a result of pain, disfigurement or disability. Thus, amputation often is of a palliative nature, permitting the patient a period of relief from symptoms during which time there is a temporary gain in weight and improvement of morale. Postoperative irradiation, as well as administration of Coley's toxins, is employed in the hope of destroying unrecognized metastatic growths. Although a considerable fraction of the patients who came to amputation had undergone previous conservative surgical treatment or surgical treatment combined with irradiation and administration of Coley's toxins, instead of early amputation, the five year survival rate after amputation at the clinic was 24.7 per cent (table 2).

The site of amputation should be well away from the tumor. Patients frequently insist on saving length of limb and thus risk the possibility of local recurrence. Amputation above the knee should be performed if the tumor is about the ankle and through the upper part of the femur if the tumor is about the knee joint. If a tumor is in the region of the elbow, high humeral amputation or disarticulation at the shoulder usually is preferred. The choice of operation is, as we already have emphasized, in relation to the degree of malignancy. In our series, when the malignant condition was of grade 1 amputation never was employed (table 3).

COMMENT CONCERNING OSTEOGENIC SARCOMA

In treating osteogenic sarcoma, surgical operation constitutes the method of choice. Osteogenic sarcomas as a group are highly resistant to irradiation; therefore we have not much hope of permanent benefit from this type of treatment; excision and amputation appear to be more reliable. When patients do not consent to operation, or when a tumor is inoperable, irradiation may be used to delay growth.

The five year survival rate of those patients who were treated surgically and were traced during five years was 23.4 per cent. There was no five year survival among those patients on whom nonsurgical treatment was employed. In combining surgical and medical treatment, and taking the total group, the five year survival rate was 20.3 per cent (table 2).

FIBROSARCOMA

Fibrosarcoma is a rare tumor which occurred in 38 (9 per cent) of the 424 primary malignant conditions of bone that we were studying. The same faculty called "osteogenic" in relation to osteogenic sarcoma of bone-forming cells may here be called "fibrogenic." Thus a fibrosarcoma is a malignant tumor in which the characteristic feature is the formation of fiber. In our

recent experience we learned that in many instances it is difficult, and sometimes impossible, to state whether a fibrosarcoma originates from bone. Facing this problem we decided to include in this group all the cases of fibrosarcoma in which primary involvement of bone was suspected on the basis of roentgenologic and, when possible, histologic examination. As in the other groups, males were more frequently attacked than females. Of the 38 patients, 23 (60.5 per cent) were males and 15 (39.5 per cent) were females. None was less than the age of 10 years, but 23 (60.5 per cent) were less than 30. The youngest was a boy aged 10 years, the oldest was a woman aged 62, and the average age of the 38 patients was 29.6 years. The femur was involved in 13 cases (34.3 per cent) and the tibia in 6 (15.8 per cent). The tumor was in the extremities in 27 cases (71 per cent) and around the knee joint in 19 (50 per cent). Trauma was a possible factor in 15 cases (39.5 per cent); it was not a possible factor in 5 (13.1 per cent), and concerning the remain-

usually, in the presence of high grades of malignancy in tumors was amputation whenever possible. Thus, thirteen (59.1 per cent) of the amputations were performed for tumors of grade 3 or 4, four (18.2 per cent) for tumors of grade 1 or 2 and five (22.7 per cent) for tumors which were not graded. Of the excisions employed, five (62.5 per cent) were for tumors of grade 1 or 2; 3 of these tumors (37.5 per cent) were not graded. Excision was not performed for tumors of grade 3 or 4.

Of the traced patients treated with irradiation (table 4), 16.7 per cent survived five years or more. Of patients treated by excision together with irradiation, 25 per cent of the traced patients survived five or more years whereas of those treated by amputation, with or without irradiation, 40 per cent of the traced patients lived five years or more. Thus the results of radical surgical operation in combination with post-operative irradiation appear to give the better results and the highest number of survivals for five years. It is also to be noted that amputation was performed in those cases in which the grade of malignancy was highest. Of 38 patients who had fibrosarcomas of bone, 13 (34.2 per cent) lived three or more years. Of 36 patients treated in 1932 or earlier, 11 (30.5 per cent) lived five or more years.

Comment.—Our experience leads us to believe that the fibrosarcomas which occur in bone are more amenable to surgical treatment than are osteogenic tumors, and the method of choice, whenever possible, should be biopsy performed under control with a tourniquet and immediate amputation. If this is not possible, radical excision followed by irradiation is to be carried out. Our experience with Coley's toxins in this group of cases was limited, and therefore it is impossible to draw conclusions concerning its value.

EWING'S TUMOR

Increasingly important tumors of bone often confused, clinically and roentgenologically, with osteomyelitis and giving such characteristic response to irradiation as to permit of diagnostic irradiation are those known as Ewing tumors. In 1922, Ewing classified endothelioma of bone as (1) multiple endothelioma, (2) angio-endothelioma and (3) solitary diffuse endothelioma. This endothelioma of bone is now widely accepted as an entity, but there is much doubt about its cell structure and origin. Broders has expressed the belief that the tendency of the tumor toward differentiation into blood spaces and sinusoids is suggestive of vascular origin, and he has designated the growth by the term "hemangioendothelioma." This tumor usually occurs near the middle of the shaft of a long bone, in a bone of the pelvis or in the scapula. The growth in long bones usually begins in the medullary cavity and spreads until a large segment of the shaft is involved. As the tumor grows the cancellous bone is absorbed; the shaft becomes honeycombed; when the periosteum is reached the defensive reaction forms layers of new bone and an "onion skin" formation takes place; later, with further growth, the tumor bursts through to infiltrate the soft parts. Metastasis to the regional lymph nodes and lungs may take place early; later other bones, the brain or the viscera may be involved. Endotheliomas are purely osteolytic tumors, and any formation of bone that takes place is laid down by periosteal reaction. Tumor cells have no part in the formation other than that of stimulating the periosteum.

TABLE 4.—*Fibrosarcoma; Three and Five Year Survival Rate According to Type of Treatment and Histologic Grade of Malignancy*

Group	Patients Treated *	Patients Traced	Lived Three or More Years After Treatment *		Patients Treated *	Patients Traced	Lived Five or More Years After Treatment *	
			Patients	Percentage of Traced Patients			Patients	Percentage of Traced Patients
Total group.....	38	38	13	34.2	36	36	11	30.5
Amputation.....	22	22	10	45.4	20	20	8	40.0
Excision.....	8	8	2	25.0	8	8	2	25.0
Irradiation.....	6	6	1	16.7	6	6	1	16.7
No treatment †....	2	2	0	0	2	2	0	0
Surgical cases, graded								
Grades 1 and 2.....	11	11	3	27.3	11	11	3	27.3
Grades 3 and 4.....	17	17	5	29.4	15	15	4	26.7

* Inquiry as of 1938. The three year group comprises the patients treated three or more years prior to the time of inquiry, i. e., 1934 or earlier; the five year group comprises those treated in 1932 or earlier.

† Biopsy only.

der (47.4 per cent) there was no statement as to whether trauma had occurred. Two pathologic fractures, one in the humerus and one in the ulna, were found.

Tissue was available for microscopic examination in all 38 cases. Of these, in 28 (73.7 per cent) the malignancy of the tumor was graded according to the method of Broders. Of these 28 cases, in 11 (39.3 per cent) the tumor was classified as of grade 1 or 2 and in 17 (60.7 per cent) as of grade 3 or 4 (table 4).

Of the 38 cases, in 2 (5.2 per cent) only biopsy was performed, the patients returning home after the diagnosis. In 6 (15.8 per cent) biopsy was followed by irradiation. Excision combined with irradiation was employed in 8 cases (21.1 per cent). Amputation was performed in 22 cases (57.9 per cent); of these, in 4 only amputation was performed; in 1 amputation was combined with administration of Coley's toxins, and in 17 amputation and irradiation were employed, combined in 2 cases with administration of Coley's toxins.

The type of treatment employed was modified according to the patient's or relative's wishes; some refused radical surgical measures. Furthermore, treatment was modified by the situation and size of the tumor and by the presence or absence of metastasis. Our advice,

The clinical signs of Ewing tumors are insidious onset, with vague, fleeting, aching pains which occur intermittently and usually are more severe at night than by day. During this period rheumatism usually is suspected. Pain may disappear for days or even months, only to recur with increasing frequency and severity. Tumefaction may be discovered, or pathologic fracture perhaps occurs. Chills and fever are accompanied by a temperature as high as 102 F., also by local warmth and tenderness and even fluctuation. The erroneous diagnosis of osteomyelitis may be made. Remissions may continue and the temperature becomes normal. Leukocytosis, which also is frequent, may disappear with decreasing size of the tumor. As the disease advances, pain becomes constant and severe; the limb becomes enlarged; the temperature may increase to 103 F.; anemia and cachexia develop, and rapidly fatal pneumonia, because of pulmonary metastasis, ensues.

The roentgenologic characteristic of Ewing's tumor is usually diffuse involvement of the shaft. The bone becomes widened, by the effect on both cortex and medulla, and may assume a moth-eaten appearance with the laminated onion skin feature visible in the periosteal region. Although the laminated appearance commonly is seen and is important, it is not pathognomonic; we encountered it in other conditions, such as osteomyelitis and osteogenic sarcoma.

Of the 114 patients in this series who had Ewing sarcomas, 82 (71.9 per cent) were males and 32 (28.1 per cent) females. Ewing's tumor occurs more frequently in the young than in the old. In our series 76 (66.8 per cent) of the patients were less than 30. The youngest was a girl aged 17 months and the oldest a man aged 70.

Seventy (61.4 per cent) of these tumors occurred in the extremities. Of the 114, 28 (24.6 per cent) were in the region of the knee joint. The bone most frequently affected was the femur; this bone was involved in 30 (26.3 per cent) of the cases. A positive history of trauma was given in 40 cases (35.1 per cent); a negative history was given in 21 (18.4 per cent), and in 53 (46.5 per cent) whether trauma was a factor was not stated. Pathologic fractures occurred in 18 (15.8 per cent) of the cases. Of these, eleven occurred in the femur, three in the humerus, two in the clavicle, one in the tibia and one in a rib.

Because this study includes patients treated before 1920, when systematic radiotherapy for tumors was not, to all intents, used at the clinic and, further, because this tumor was not commonly recognized until 1922, many of the patients were treated surgically. Since then increasing reliance has been placed on the radiotherapeutic test and on treatment by irradiation. In irradiation, the use of multiple converging beams has become the method of choice. This is an elaboration of the principle of cross fire, whereby four, six, eight or more beams of roentgen rays are made to converge on the neoplasm from different angles.

Of the 114 cases, in 100 (87.7 per cent) microscopic verification of the clinical diagnosis was possible. In 14 (12.3 per cent) operation was not carried out and diagnosis was based on clinical and roentgenologic examinations.

In 14 (12.3 per cent) of the 114 cases irradiation was employed, and in one of these 14 cases Coley's toxins were used in addition. In 8 cases (7 per cent) biopsy alone was performed, the patients returning home after diagnosis was made. In 43 cases (37.7 per cent) biopsy was followed by irradiation, and in 9 of these

43 cases, Coley's toxins were used in addition. Excision was performed in 15 cases (13.2 per cent), and in 14 of these irradiation was given postoperatively and in 1 Coley's toxins. Amputation was performed in 34 cases (29.8 per cent), and in 14 of these amputation alone or amputation and Coley's toxins were employed. In 17 of these 34 cases both amputation and irradiation were employed and in 3 amputation, irradiation and Coley's toxins.

Of the patients traced over a period of five years after treatment with roentgen rays 37.5 per cent were living. Of those patients from whom only a specimen for biopsy was taken and who were traced for five years none was living. Of traced patients subjected to biopsy and irradiation, 20.5 per cent survived five years or more. Excision together with irradiation or use of Coley's toxins, or all combined, gave survival for five years of 16.7 per cent of patients who received such treatment. Amputation, alone or combined with irradiation or use of Coley's toxins or combined with both of

TABLE 5.—Ewing's Tumor: Three and Five Year Survivals According to Type of Treatment and Grade of Malignancy

Group	Patients Treated *	Patients Traced	Lived Three or More Years After Treatment		Patients Treated *	Patients Traced	Lived Five or More Years After Treatment	
			Patients	Percentage of Traced Patients			Patients	Percentage of Traced Patients
Total group.....	114	113	32	28.3	100	99	21	21.2
Amputation.....	34	34	11	32.3	33	33	8	24.2
Excision.....	15	14	3	21.4	13	12	2	10.7
Irradiation.....	57	57	18	31.0	47	47	11	23.4
No treatment.....	8	8	0	0	7	7	0	0
Surgical cases, graded								
Grades 1 and 2.....	16	16	4	25.0	16	16	3	18.7
Grades 3 and 4.....	57	57	9	15.8	52	52	8	15.4

* Inquiry as of 1938. The three year group comprises the patients treated three or more years prior to the time of inquiry, i. e., 1934 or earlier; the five year group comprises those treated in 1932 or earlier.

† With or without biopsy.

‡ Biopsy only.

these adjunct measures, was followed by survival for five years of 24.2 per cent of traced patients. Among the 114 patients treated and traced, 21.2 per cent survived five years (table 5).

Comment.—In some instances, even though intense involvement, destruction of joints, pathologic fracture, previous operations or infection obscured the nature of the lesion, biopsy or surgical operation seemed necessary and justifiable. Adequate irradiation frequently will cause early tumors to disappear and the bone to assume a normal appearance. The physician should bear in mind that clinically and roentgenologically, and sometimes surgically, this tumor may simulate inflammation and as a result the diagnosis may be osteomyelitis. As experience increases one recognizes the increasing importance of irradiation as a diagnostic and therapeutic agent.

MULTIPLE MYELOMA

The clinical picture of multiple myeloma is vague. Rheumatic pain, neuritic pain or what appears to be neuritic pain, with or without fever, are early symptoms. Later the weakness, loss of weight and anemia suggest a malignant condition. There may be spinal deformity, referred pain and a history of pathologic frac-

ture. Large quantities of protein have been found in the urine in a large percentage of cases; therefore examination for Bence Jones protein should be performed routinely. Symptoms are intermittent, and periods of recession may occur. Careful examination of the spinal columns of elderly patients who have unexplained abdominal pain is essential, as multiple myeloma may be the cause. Soft, tender masses in the sternum, ribs and clavicle are not uncommon.

With further involvement, progressive anemia and exhaustion appear, and weight is lost. A large number of the patients have passed 40 years of age. Roentgenologic examinations of the spinal column, thorax and skull in suspected cases may give evidence of multiple regions of destruction. When multiple myeloma occurs in the skull it appears to be punched out and has a well defined margin. A distinctive feature of these tumors, from the roentgenologic standpoint, is that they usually are multiple and occur simultaneously in the bone marrow, especially of the spinal column, sternum, ribs, skull and clavicles.

Strain, such as heavy lifting, may result in crushing or fracture of the involved bone. The tumor may be

Comment.—Males were afflicted three times more often than females. Almost three fourths of the tumors occurred after the patient had passed the age of 40; more than half were recognized as multiple at the time of the original diagnosis. Treatment proved of little avail.

GIANT CELL SARCOMA (MALIGNANT)

Malignant giant cell sarcoma has been, in our experience, an extremely rare condition (table 6); it accounted for only 7 (1.6 per cent) of the primary malignant growths of bone. Of the patients 3 were males and 4 females; all were between the ages of 10 and 40. The femur was involved in 3 cases and the tibia, fibula, sacrum and ulna each in 1 case. In 1 case biopsy was performed; in 1 excision was followed by irradiation, and in 5 amputation was followed by irradiation. Of the patients traced for five years or more after treatment, 83.3 per cent had survived.

These malignant giant cell tumors are recognizable as such only on microscopic study. The tissue in our cases was studied by Dr. Broders, who corroborated the original diagnosis.

TABLE 6.—Primary Malignant Tumors of Bone: Type of Treatment of Each Type of Tumor

Type of Treatment	Osteogenic Sarcoma		Ewing's Sarcoma		Fibrosarcoma		Multiple Myeloma		Malignant Giant Cell Sarcoma		Nonsurgical Diagnosis of Sarcoma		Total	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
	216	100	114	100	38	100	41	100	7	100	8	100	424	100
Amputation*	49	41.2	34	29.8	22	57.9	4	9.7	5	71.4	0	0	154	36.4
Excision*....	56	25.9	15	13.2	8	21.1	4	9.7	1	14.3	0	0	84	19.8
Irradiation†.	60	30.6	57	50.0	6	15.8	29	70.7	0	0	8	100	106	39.1
No treatment‡	5	2.3	8	7.0	2	5.2	4	9.7	1	14.3	0	0	20	4.7

* With or without irradiation.

† With or without biopsy.

‡ Biopsy alone.

so extensive as to make differential diagnosis difficult; thus surgical measures may be needed for diagnosis.

In our series, 41 (9.7 per cent) of the primary malignant growths of bone were multiple myelomas (table 6). Thirty-one (75.6 per cent) of the patients were males; 10 (24.4 per cent) were females. These tumors occurred most commonly after patients had passed the age of 40. Thirty (73.2 per cent) occurred when the patients were between the ages of 40 and 70. The youngest patient was a boy aged 4 years and the oldest, a man aged 70. At the time of examination multiple lesions were found in 21 cases (51.2 per cent). In some instances the tumor was not recognized as consisting of multiple lesions, but surgical operation was necessary and its true character became evident on microscopic examination. Subsequent examinations also proved, in other cases, the multiple character of what originally was thought to be a single lesion. A history of trauma was obtained in 13 (31.7 per cent) of the cases; in 5 (12.2 per cent) there was no history of trauma, and in 23 (56.1 per cent) there was no statement relative to trauma.

Pathologic fractures were found in 8 (19.5 per cent) of the cases. In 4 cases (9.7 per cent) biopsy alone was performed to clear up the diagnosis. In 29 (70.7 per cent) treatment was by irradiation. In 4 cases excision of the primary tumor was followed by irradiation, and in 4 amputation was advisable.

Of the patients treated and traced for five years, only 1 (3.6 per cent) survived.

COMMENT ON THE ENTIRE SERIES

Of the total number of primary malignant tumors of bone encountered at the Mayo Clinic from 1909 through 1934, 216 (50.9 per cent) were osteogenic sarcoma, 114 (26.9 per cent) were Ewing sarcoma, 38 (9 per cent) were fibrosarcomas, 41 (9.7 per cent) were multi-

TABLE 7.—Primary Malignant Tumors of Bone: Three and Five Year Survival Rate According to Type of Treatment

Treatment	Patients Treated *	Patients Traced	Lived Three or More Years After Treatment		Patients Treated *	Patients Traced	Lived Five or More Years After Treatment	
			Patients	Percentage of Traced Patients			Patients	Percentage of Traced Patients
Surgical.....	261	356	109	30.6	225	314	72	22.9
Nonsurgical.....	63	61	14	22.9	46	41	4	9.1
Total.....	424	417	123	29.5	371	255	76	21.2

* Inquiry as of 1935. The three year group comprises the patients treated three or more years prior to the time of inquiry, i. e., 1934 or earlier; the five year group comprises those treated in 1933 or earlier.

ple myelomas and 7 (1.6 per cent) were giant cell sarcomas (malignant), and there remained 8 (1.9 per cent) concerning which a nonsurgical diagnosis of sarcoma was made (table 6). More than two thirds of the patients, 291 (68.6 per cent), were males and 133 (31.4 per cent) were females.

Twenty-four (5.7 per cent) of the patients were less than 10 years of age. Considered by decades of life, the largest percentage of patients were of the decade 10 to 19 years, namely 133 (31.4 per cent). In the decade 20 to 29 there were 92 patients (21.7 per cent). Thus, 249 (58.8 per cent) of the patients were less than 30, and more than half of the tumors occurred when the patients were in the early years of life.

The femur, which was the bone most commonly affected, was the site of the tumor in 124 cases (29.3 per cent); next in order was the tibia, represented by 60 cases (14.2 per cent). Of the total of 424 tumors, 266 (62.8 per cent) were in the extremities.

Of the 40 cases in which there were pathologic fractures, the bones most commonly attacked were the femur and humerus; each was the site of the tumor in 13 cases (32.5 per cent). The highest percentage of pathologic fractures occurred in association with multiple myelomas (19.5 per cent). In association with Ewing's sarcoma the incidence of pathologic fracture was 15.8 per cent, with osteogenic sarcoma 5.5 per cent and with fibrosarcoma 5.3 per cent. Pathologic fractures were not encountered in association with giant cell sarcoma (malignant) or in those cases in which a nonsurgical diagnosis of sarcoma was made. The tendency of multiple myeloma and Ewing's sarcoma to appear in the shafts of long bones and the osteolytic characteristics of these tumors, by lessening the strength of the bone, probably account for the occurrence of pathologic fracture in association with them. Osteogenic sarcomas frequently appear in the ends of the bones, and this, together with the increased formation of bone that accompanies development of the tumor, renders the bone unlikely to fracture. The treatment of pathologic fracture, unless amputation is performed, is fixation and irradiation.

Although we do not believe that trauma is the etiologic factor in primary malignant tumors of bone, our records contained a positive history of trauma in 40.6 per cent of the cases and a negative history in 18.4 per cent, and in the remaining 41 per cent there was no statement concerning trauma. We appreciate the medicolegal significance of trauma, for often trauma is associated by patients with the appearance of a tumor.

The type of treatment employed in the 424 cases can be roughly given as follows: In slightly more than a third of the cases amputation was performed; in about a fifth, excision; after these radical surgical procedures irradiation, together with or without the administration of Coley's toxins, was carried out. In a fourth of the cases biopsy and irradiation were employed; in the majority of the remainder of the cases treatment was by irradiation only. More details are given in table 6.

Of those patients who had primary malignant tumors of bone and who were traced for five years after the first treatment, 22.9 per cent of those who received surgical treatment had survived; of those whose diagnosis and treatment was carried on without surgical measures, 9.1 per cent had survived. Of all patients traced five years, 21.2 per cent had survived (table 7).

GENERAL IMPRESSIONS

It is obvious, from long experience, that roentgenologic treatment of tumors of bone is not a cure. Yet, such treatment has an important field of usefulness. Roentgen rays are invaluable in diagnosis, prognosis and treatment of certain types of tumors, especially Ewing tumors, and furnishes the earliest knowledge of the presence of pulmonary metastasis. The possibilities of

irradiation, we believe, have not been exhausted, and with the passage of time its application will be improved and its therapeutic value increased.

We are firmly convinced that surgical operation offers the best method of treatment for the majority of primary malignant tumors of bone.

We urge surgeons, roentgenologists and pathologists to cooperate, for only through their combined efforts will diagnosis, prognosis and therapeutic measures be improved. Equally important is education of the practitioner of internal medicine in recognizing the presence of these malignant tumors and in seeking immediate consultation with those experienced and qualified to give advice. Only through early diagnosis, efficient early treatment and careful follow-up investigation can more extremities and lives be saved than have been saved in the past.

THE CONFUSING MULTIPLICITY OF SEROLOGIC TESTS FOR SYPHILIS

STANDARDIZATION OF THE SEROLOGIC REPORT AS A POSSIBLE SOLUTION

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Six years ago the U. S. Public Health Service and the American Society of Clinical Pathologists sponsored the first of a series of serologic conferences.¹ Invited to participate in the original conference were thirteen of the country's leading serologists, most of whom had developed one or more complement fixation or flocculation procedures, identified in each case by the name of its proponent. Duplicate samples of several hundred specimens of known syphilitic and non-syphilitic donors were submitted to each serologist, to be tested by his procedure, and data were thus obtained with respect to the sensitivity and specificity of these technics under ideal conditions.

It was hoped that as a result of this conference the excessive number of technics previously in use might be reduced to a few standard procedures suitable for general adoption and the long-sought standardization of serologic tests thereby furthered. Unfortunately for this hope, not a few but many technics were found to give satisfactory results, and the group of tests appearing in table 1 were given tacit approval by the committee charged with the evaluation of the results.

The laboratories in which these tests were developed were designated as control laboratories and in the five succeeding years were used as yardsticks against which the performance of state health department laboratories and indirectly of municipal and private laboratories as well could be conveniently measured. Each year, duplicate specimens of known syphilitic and nonsyphilitic donors have been sent to the participating state health department laboratories, and the results have been checked by comparison with those obtained in the

¹Read before the Association of American Physicians, Atlantic City, N. J., May 6, 1941, and the American Society of Clinical Pathologists, May 30, 1941.

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1. Cumming, H. S.; Hazen, H. H.; Sanford, A. H.; Senear, F. E.; Simpson, W. M., and Vonderlehr, R. A.: The Evaluation of Serologic Tests for Syphilis in the United States, Ven. Dis. Inform. 16: 189 (June) 1935.

several control laboratories.² Well considered criteria of approval have been set up; viz., at least 99 per cent specificity (not more than 1 per cent false positive and doubtful results in a group of known nonsyphilitic serums) and a sensitivity in syphilitic serums within 10 per cent of that of the control laboratory using the same technic.

TABLE 1.—Approved Serologic Tests

Complement fixation techniques:	
Kolmer (modification of the Wassermann test)	
Eagle (modification of the Wassermann test)	
Flocculation techniques (standard):	
Kahn standard	
Kline diagnostic	
Eagle macroflocculation	
Hinton	
Screen flocculation (supersensitive, for special purposes)	
Kahn presumptive	
Kline exclusion	

Largely as a result of the objective self criticism which these cooperative and voluntary surveys have made possible, the average level of performance in the state health department laboratories has risen steadily; and similar intrastate or intramunicipal surveys conducted under the auspices of the corresponding state or municipal laboratories will do much to improve the general caliber of serodiagnostic work.

THE PROBLEM

It was, however, neither to be expected nor to be desired that serologic investigation should stop with the 1935 conference, for that would obviously mean stagnation rather than standardization. In the six years which have since elapsed, numerous other techniques have been developed in this country, considered by their originators to be simpler, more reliable or more sensitive than the tests previously elaborated.

To a large extent this barrage of new procedures reflects the increased emphasis on serodiagnosis as a case finding procedure in the current syphilis control program. To a certain extent also it reflects the peculiar urge which seems to beset the soul of many serologists to create techniques which, even though differing only slightly from others, will bear their names. This form of serologic exhibitionism is made worse by the almost religious fervor with which certain serologists polemically defend the virtues of their own tests over all others. Be that as it may, some of these suggested procedures are undoubtedly equal, and in some respects superior, to the techniques which preceded them and on which they are based. Some, but by no means all, of the more promising of these new modifications are shown in table 2.

Quite properly, most of these new and apparently satisfactory procedures are to undergo evaluation in comparison with previously approved techniques in a conference which has been tentatively announced for this fall³ and which, like the first American conference, is designed to test the performance of these tests in the hands of the originators themselves. If all are approved (and there is reason to believe that most of them will

have the necessary sensitivity and specificity) there will then be fifteen to twenty tests officially or tacitly designated as satisfactory.

Therein lies the rub. Faced with such a galaxy of tests, the physician who must interpret the laboratory report will find himself hopelessly confused in a veritable maze of proper names and plus marks. Many laboratories, in the effort to provide "super service," already run a battery of three, four, five or even nine tests on each specimen; and when the physician attempts to clarify contradictory findings by sending a duplicate specimen to a second laboratory, he may be faced with an array of serologic results such as those given in table 3, actually reported on a patient with no clinical evidence or history of syphilitic infection. Not only the average practitioner, but also the expert, whether clinician or serologist, is likely to be completely befuddled.

In this connection the two functions of the serologic tests for syphilis must be sharply differentiated. One, and far the lesser in importance, is in following the results of treatment. Here the serologic tests may furnish information which, in the hands of the informed expert, may be of value from the investigative point of view. As a practical guide to treatment, however, the value of the serologic tests is debatable. A respectable body of expert syphilologic opinion is now veering to the point of view that, except for purposes of study as just discussed, repeated blood tests on patients under treatment are almost valueless. By and large, syphilis early or late would be better managed by the average physician if, the diagnosis having been established, no

TABLE 2.—Serologic Tests to Be Evaluated

Complement fixation techniques:	
Wadsworth, Augustus; Maltaner, Frank, and Maltaner, Elizabeth: <i>J. Immunol.</i> 35: 105 (Aug.) 1938 *	
Boerner, Fred, and Lukens, Marguerite: <i>Am. J. Clin. Path.</i> 9: 113 (Jan.) 1939. Boerner, Fred; Jones, O. A., and Lukens, Marguerite, <i>ibid.</i> 10: 141 (Nov.) 1940	
Gnehtgens ("Pallida")† (Gaehdgens, W.: <i>Ztschr. f. Immunitätsforsch. u. exper. Therap.</i> 63: 398 (June) 1939. Eagle, Harry, and Hogan, R. B.: <i>J. Exper. Med.</i> 71: 215 (Feb.) 1940. Erickson, F. T., and Eagle, Harry: <i>Ven. Dis. Inform.</i> 31: 31 (Feb.) 1940)	
Flocculation techniques:	
Boerner-Jones-Lukens (cited above)	
Davies micromodification of Hinton (Davies, J. A. V.: <i>J. Lab. & Clin. Med.</i> 22: 950 (June) 1937)	
Mazzini, L. Y.: <i>Am. J. Clin. Path.</i> 9: 163 (March) 1939	
Laughlin, G. F.: <i>Canad. M. A. J.</i> 33: 179 (Aug.) 1935	
Eagle microflocculation (Eagle, Harry, and Brand, A. F.: <i>Am. J. Syph., Gonorr. & Ven. Dis.</i> 22: 22 (Jan.) 1938)	
Melnecke, E.: <i>Ztschr. f. Immunitätsforsch. u. exper. Therap.</i> 70: 1965 (Nov. 22) 1939	
Müller, R.: <i>Klin. Wchnschr.</i> 11: 1916 (Nov.) 1932	
Ide, S., and Ide, T.: <i>Jap. J. Dermat. & Urol. (abst. sect.)</i> 39: 22 (Feb.) 1936	
Chediak, A.: <i>Dia. méd.</i> 11: 294 (April 10) 1939	
Strauss slide modification of Kahn and Eagle (Strauss, J. H.: <i>Am. J. Syph., Gonorr. & Ven. Dis.</i> 25: 186 (March) 1941)	
"Verification" test:	
Kahn *	

* Quantitative test.

† Or some American modification thereof. This depends on the use of a suspension of cultured spirochetes as antigen, instead of an alcoholic extract of beef heart, and has been recommended as perhaps more specific than the traditional Wassermann test.

serologic tests (spinal fluids excepted) were performed during treatment. If neither physician nor patient concerned himself with apparent serologic improvement, or the lack of it, two heads would rest more easily on a difficult pillow.

The second and far more important function of the serologic tests is in the diagnosis of syphilis. Here

2. Farran, Thomas; Hazen, H. H.; Sanford, A. H.; Sencar, F. E.; Simpson, W. M., and Vonderlehr, R. A.: The Efficiency of State and Local Laboratories in the Performance of Serodiagnostic Tests for Syphilis, *Ven. Dis. Inform.* 18: 4 (Jan.) 1937. Farran, Thomas; Hazen, H. H.; Mahoney, J. F.; Sanford, A. H.; Sencar, F. E.; Simpson, W. M., and Vonderlehr, R. A.: Serodiagnostic Tests for Syphilis in Thirty-Nine State Laboratories, *ibid.* 18: 273 (Aug.) 1937.

3. Second Evaluation of Serologic Tests, General News, *J. A. M. A.* 115: 143 (July 13) 1940.

their interpretation is in the hands of physicians of all medical disciplines, most of whom deal with syphilis only rarely, and nearly all of whom are completely in the dark as to the newest refinements of serologic technic. To such physicians the multiplication of technical procedures, and the use in one laboratory of a serologic "battery" larger than the two or three tests desirable for intralaboratory check, serve no useful purpose.

On the contrary, the larger the number of tests applied to each serum the higher will be the proportion of serums in which conflicting results will be obtained and in which the physician must therefore evaluate the serologic findings. All too often, given a patient with findings suggestive, but not diagnostic, of syphilitic infection, and given a serologic report of e. g. Kahn positive, Hinton doubtful and Kolmer negative, the physician will seize on the positive result as confirming his clinical suspicions, dismiss the negative result as due to a laboratory error or an insensitive test and institute treatment for syphilis.

To a limited extent the problem of evaluation presented by multiple or conflicting tests is one of education. If every physician would hold fast to the following principles, much of the existing confusion as to the correct interpretation of the laboratory report, and many errors in diagnosis, errors both of omission and commission, would be avoided.

1. All the Wassermann and flocculation tests for syphilis in which tissue extracts are used as antigen are designed to detect the same substance, so-called reagin, which is probably an antibody to *Spirochaeta pallida*.⁴

2. Basically there are only two such tests for syphilis, a complement fixation and a flocculation test. Every one of the dozens of flocculation technics (and every one of the equally numerous Wassermann technics) is fundamentally identical, differing only by variations, often very minor, in the method of preparation of antigen, in the concentration of salt solution, cholesterol or other reagents, or in such technical differences as the time of incubation, the temperature at which the test is performed or other (often infinitesimally small) details of procedure. Any one of the technics now in general use "is an entirely adequate test in the hands of a competent worker. Conversely, not one of them is reliable in the hands of an incompetent worker. The method of choice is dictated by the training of the individual technician, his personal aptitudes and his experience with the various tests."⁵

3. Finally, and most important of all for an intelligent interpretation of the serologic report, any two tests applied to the same serum may, in the borderline case, give discrepant results; and the more tests used by any one laboratory the greater will be the number of serologic conflicts requiring special interpretation.

Such "serologic education" of the average practitioner would do much to clarify a confusing situation. However, that confusion is engendered in the laboratory, and we feel that its solution also lies primarily in the laboratory.

A SUGGESTED SOLUTION

Research will and must proceed. Serologists will and should continue to improve serologic tests by whatever

technical modifications seem desirable. However, it follows also that the present chaotic situation with respect to the multiplicity of tests will become continuously worse rather than better. The ultimate standardization of serologic technic seems less and less likely of fulfillment, at least until that improbable future day when, reagin having been found to be chemically identifiable, a simple chemical test can replace the present complicated biologic procedures.

Since standardization of technic is not immediately attainable, some order may be brought out of existing chaos by standardization in a simpler direction—that

TABLE 3.—*An Actual Serologic Report: What Does It Mean?*

	2+
	4+
	2+
	0
	++++
Kahn verification.....	0
New York State complement fixation.....	4.7 units
Eagle complement fixation.....	Zone (003444300)
Eagle macroflocculation.....	Positive
Kolmer.....	440
"Pallida".....	Doubtful

of reporting serologic results. To that end the following change in the method of reporting the results of serologic tests seems immediately desirable and is recommended to the U. S. Public Health Service, to the American Society of Clinical Pathologists and to author serologists for their serious consideration:

1. In recognition of the fundamental identity of all the serodiagnostic tests for syphilis, the generic term "Serologic Test for Syphilis," conveniently abbreviated as "STS", is recommended for general adoption. This generic term embraces the five types of test in current use:

Screen flocculation: Any supersensitive flocculation technic known to give false positive or doubtful results in a variable proportion of normal individuals.

Flocculation: Any standard flocculation technic in which an alcoholic tissue extract is used as antigen.

Complement Fixation: Any standard Wassermann technic in which an alcoholic tissue extract is used as antigen.

Spirochetal Complement Fixation: Any complement fixation technic employing a spirochetal suspension as antigen rather than beef heart extract.

Verification: The present Kahn verification test⁶ or other similar tests subsequently to be developed.

2. By general agreement, the formal laboratory report to the physician should be made on an over-all, composite basis, simply as "Serologic Tests for Syphilis—Positive," "Serologic Tests for Syphilis—Doubtful" or "Serologic Tests for Syphilis—Negative."

3. The results of the individual tests, on which that over-all summation is based, may be given on the reverse of the serologic report.

4. Finally, and highly important, the serologic report slip should contain an informative statement as to the significance of this composite report, e. g.:

Positive: A result of positive implies that all the tests used in this laboratory (cf. reverse of this report) indicate the presence of a reactive factor in the serum commonly associated with syphilitic infection. However, a diagnosis of syphilis must not be made solely on the basis of a single positive test. If the serologic result is not supported by history and/or physical findings, a second specimen of blood should be submitted for check. If the result of the check also is positive,

6. Kahn, R. L.: Serologic Verification Test in Diagnosis of Latent Syphilis, *Arch. Dermat. & Syph.* 41: 817 (May) 1940.

4. Eagle, Harry: Laboratory Diagnosis of Syphilis, St. Louis, C. V. Mosby Company, 1937.

5. Eagle, Harry: The Serodiagnosis of Syphilis, Supplement 9 to Venereal Disease Information, 1938, p. 5.

syphilis is indicated with a high degree of probability, unless the patient has, or has just recovered from, some intercurrent infection which may cause a false positive result.

Doubtful: A report of doubtful implies that the individual tests used in this laboratory were either discrepant or inconclusive (incomplete aggregation in the flocculation test, partial fixation of complement in the Wassermann). A doubtful result may or may not indicate syphilis. If the patient is known to have been infected with syphilis, and particularly if he has been treated, a doubtful reaction may be regarded as positive. If there is no history or clinical evidence of syphilis, a doubtful test indicates the necessity for, first, a particularly careful review of history and physical findings and, second, an immediate repeat serologic test for check. If the result of the check examination is likewise doubtful, the serologic examination should be repeated in this and other laboratories and, if necessary, several times by several different serologic procedures, before the possibility of syphilis is dismissed.

Negative: A report of negative implies that the particular tests used in this laboratory did not indicate the presence

TABLE 4.—Suggested Composite Reporting of Two Tests

Test A	Test B	Suggested Over-All Report
Positive	Positive	Positive
Positive	Doubtful	
Doubtful	Positive	
Positive	Negative	Doubtful
Negative	Positive	
Negative	Doubtful	
Doubtful	Negative	
Doubtful	Doubtful	Negative
Negative	Negative	

TABLE 5.—Suggested Composite Reporting of Three Tests

Test A	Test B	Test C	Suggested Over-All Report
Positive	Positive	Positive	Positive
Positive	Positive	Doubtful*	
Positive	Positive	Negative*	Doubtful
Positive	Doubtful	Doubtful	
Positive	Doubtful	Negative	
Doubtful	Doubtful	Negative	
Doubtful	Doubtful	Doubtful	
Positive	Negative	Negative	
Doubtful	Negative	Negative	Negative
Negative	Negative	Negative	

* There are obviously multiple combinations of three tests, in which e. g. two will be positive and the third doubtful. For the sake of clarity, those combinations are not distinguished in the table.

of reagin (absence of visible aggregation in the flocculation test and no fixation of complement [complete hemolysis] in the complement fixation test). A negative report does not exclude the possibility of syphilis.

Frequently a positive test is absent in the early stages of primary syphilis. Negative reactions may occur as a result of treatment. If there is any clinical reason to suspect syphilis, a negative result should be checked by a second blood specimen. The diagnosis of early primary syphilis should, if possible, be made by darkfield rather than by serologic test.

Physician and laboratory alike should bear in mind that, when screen flocculation tests are employed, the result should be reported to the physician only if it is negative. Because of their known tendency to give false reactions, a positive or doubtful result unsupported by some standard procedure may or may not be of significance and can serve only to confuse the physician, while, if the standard procedure is positive or doubtful, the similarly positive or doubtful screen test is of no confirmatory value. On the other hand, a negative screen test may safely be reported, since it may properly be assumed that a serum which is negative with one

of the supersensitive screen tests would have been similarly negative with the standard test on which the screen test is based. The correct use of screen procedures has been commented on more fully in the editorial columns of *THE JOURNAL*.⁷

The onus of unifying conflicting serologic results is thus taken out of the hands of the physician and placed where it belongs, in the laboratory itself. Certainly the laboratory director, cognizant of the day to day variations in the sensitivity and reliability of the individual technics, is better able to evaluate conflicting results than is the physician, to most of whom a battery of names such as Mazzini, Hinton, Eagle and Kline is a battery of names and but little else. Nor will the task of making an over-all report be a particularly easy one, even for the laboratory director. In the simplest possible case, when two flocculation tests are used as an intralaboratory check, there are nine possible combinations of results (table 4). If three tests are used, the number of possible combination becomes twenty-seven (table 5) and, if five tests are used, there are one hundred and twenty-five possible combinations.

It is to be noted that many different types of conflicting results are reported as doubtful, for that indeed is what they are. The physician who receives such a report on a patient with no history or clinical evidence of syphilitic infection is in a perplexing situation and one which often requires special skills and special knowledge. We⁸ have elsewhere outlined a suggested course of study on patients suspected of giving biologic false reactions. Those same procedures are equally applicable in the present instance. Often enough, after the physician has exhausted all possible avenues of approach he must deliberately choose between the lesser of two evils, between a possible error of omission and one of commission. Although it is generally advisable to withhold treatment and to keep the patient under close clinical and serologic observation for as long as may be necessary to establish or eliminate the diagnosis of syphilis, many factors, such as marital status and pregnancy, must affect that decision.

SUMMARY

The ever increasing number of tests available for the serum diagnosis of syphilis, and the necessity for interpreting conflicts between them, place a burden of evaluation on the physician which, lacking the necessary technical knowledge, he is often not qualified to assume.

Although the standardization of serologic technic is not yet feasible, it is possible to standardize the method of reporting serologic results. In the interests of simplicity, clarity and the best possible utilization of the laboratory data it is therefore recommended that the proper names now used in reporting serologic tests be replaced by the generic term "Serologic Tests for Syphilis" (abbreviated "STS"), of which in routine practice there are three categories: screen flocculation, standard flocculation and complement fixation. It is further recommended that the results of the laboratory findings, whether flocculation or complement fixation tests, single or multiple tests, be reported on an over-all composite basis, as "Serologic Tests for Syphilis—Positive, Doubtful or Negative."

7. "Presumptive," "Exclusion" and "Screen" Tests for the Serologic diagnosis of Syphilis, editorial, J. A. M. A. 112: 541 (Feb. 11) 1939.
8. Moore, J. E.; Eagle, Harry, and Mohr, C. F.: Biologic False Positive Serologic Tests for Syphilis: 111. A Suggested Method of Approach to their Clinical Study, J. A. M. A. 115: 1602 (Nov. 9) 1940.

The onus of unifying conflicting laboratory findings is thus placed on the individual best qualified, the laboratory director. No information of diagnostic significance is withheld from the physician, for the reverse of the report sheet will carry a statement as to the results obtained with the individual tests, on which the over-all report is based.

GONORRHEAL URETHRITIS IN THE MALE

TREATMENT WITH SULFAPYRIDINE AND
SULFATHIAZOLE

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PHILADELPHIA

The chemotherapeutic treatment of gonorrhea, when first inaugurated, promised Utopia to the physician in the case of management and to the patient in the rapidity of cure. Sufficient evidence has accumulated and adequate time has now elapsed to point out the fallacy of first impressions. This fact must be appreciated if gonorrhea is not to become an even greater problem than it was prior to the introduction of the sulfonamide derivatives.

The Cooperative Clinical Committee for the Study of Treatment of Gonorrhea in the Male¹ has stated that in the use of sulfanilamide alone cure can be promptly attained in only 25 to 40 per cent of dispensary patients and that reports of sulfapyridine therapy establish it as being 25 to 50 per cent more efficient. Other derivatives have been studied, but, mostly because of untoward toxic effects, they have been supplanted by sulfapyridine and sulfathiazole. These two drugs offer a higher percentage of cures than any others heretofore utilized therapeutically.

MATERIAL

During the past year we conducted a study of the effectiveness of chemotherapy in gonorrhea in two parallel groups of cases. Sulfapyridine and sulfathiazole were given in a series of 87 and 55 cases respectively.² The patients, all males, were ambulatory and were seen in the Genito-Urinary Clinic of the Philadelphia General Hospital. The cooperative spirit and intellectual level of the patients treated were not outstanding. This was a serious obstacle to satisfactory termination of treatment but was overcome by a sympathetic approach to each patient and by the supervision of contacts by the social service department.

TREATMENT AND RESULTS

Because of the large number of patients seen in each clinic hour and the inability to combine local therapy with oral therapy in each instance, it was decided to

limit the treatment of every patient to oral medication. In this manner the treatment of the two groups was standardized to follow certain lines which permitted a fairer comparison in the final analysis.

In the sulfapyridine-treated group 92 per cent were cured and 8 per cent were not, and in the sulfathiazole-treated group 96 per cent were cured and 4 per cent were not (table 1). The failures were due in every instance to resistant strains of gonococci which failed to respond to small or large doses or to failure of the patient to cooperate. Medical science recognizes the word cure as a flexible one, and certainly in gonorrhea such a term must be used cautiously. Ninety-two and 96 per cent cures respectively are noteworthy, but when broken down by further analysis one can see that cure is not immediate or instantaneous. Ninety-two per cent represents an average of fifty-one days, with a range of from fourteen to one hundred and sixty-two days, for a cure to be effected with sulfapyridine. In comparison, 96 per cent represents an average of twenty-eight days, with a range of from seven to eighty-eight days, for a cure to be effected with sulfathiazole. These figures were obtained by taking the time elapsed from the beginning of specific therapy to the appearance of the first culture negative for the gonococcus.

To run a second series of cases, employing the combined form of therapy with all other factors the same, would be most expedient. However, it is our impression from our experience in clinic and private practice that it is preferable to use the time-honored standard routine of treatment along with chemotherapy. This

TABLE 1.—Summary of the Results of Treatment of Gonorrheal Urethritis in the Male with Sulfapyridine and Sulfathiazole in the Philadelphia General Hospital, 1939-1940

	Total Patients		Cured		Not Cured		Defaulters	
	Treated	Followed	No.	%	No.	%	No.	%
Sulfapyridine, 87 cases								
Total cases.....	87	62	57	92	5	8	25	23.8
Acute urethritis.....	83	59	54	91.5	5	8.5	24	28.8
Anterior.....	64	43	38	88.5	5	11.5	21	32.8
Posterior.....	19	16	16	100	0	0	3	15.8
Subacute urethritis.....	4	3	3	100	0	0	1	25
Anterior.....	1	1	1	100	0	0	0	0
Posterior.....	3	2	2	100	0	0	1	33.3
Anterior urethritis (total)...	65	44	39	88.5	5	11.5	21	32.4
Posterior urethritis (total)...	22	18	18	100	0	0	4	18.2
Sulfathiazole, 55 cases								
Total cases.....	55	50	48	96	2	4	5	9
Acute urethritis.....	52	48	46	96	2	4	4	8
Anterior.....	34	31	29	94	2	6	3	9
Posterior.....	18	17	17	100	0	0	1	6
Subacute urethritis.....	3	2	2	100	0	0	1	33
Anterior.....	2	1	1	100	0	0	1	50
Posterior.....	1	1	1	100	0	0	0	0
Anterior urethritis (total)...	36	32	30	94	2	6	4	11
Posterior urethritis (total)...	19	18	18	100	0	0	1	5

impression is in direct line with the observations of the committee composed of representatives of the American Neisserian Medical Society and the United States Public Health Service.³

DOSAGE AND RESULTS

Chemotherapy has its virtues. First, the patient is made more comfortable by the disappearance of symptoms and less liable to contaminate his surroundings in consequence of the almost immediate cessation of urethral discharge. The average duration of the discharge

From the Genito-Urinary Clinic of the Philadelphia General Hospital. Merck & Co., Inc., of Rahway, N. J., furnished the sulfapyridine used and the Maltbie Chemical Co., of Newark, N. J., furnished the sulfathiazole.

The members of the medical and urologic staffs, the outpatient department, the laboratory and the social service department of the Philadelphia General Hospital cooperated in this study.

1. Pelouze, P. S.: The Pharmacopeia and the Physician: Oral and Medical Treatment of Gonorrhea in the Male, J. A. M. A. 114:1878-1881 (May 11) 1940.

2. LaTowsky, L. W.; Knight, Frank, and Uhle, C. A. W.: The Treatment of Gonorrheal Urethritis in the Male with Sulfapyridine: A Study of Eighty-Seven Cases, Am. J. Syph., Gonorr. & Ven. Dis. 25: 445 (July) 1941. Knight, Frank; Uhle, C. A. W., and LaTowsky, L. W.: The Treatment of Gonorrheal Urethritis in the Male with Sulfathiazole: A Study of Fifty-Five Cases, J. Urol. 44: 743 (Dec.) 1940.

3. Pelouze, P. S., and others: Gonorrhea in the Male: Results of Treatment with Sulfanilamide, J. A. M. A. 115:1630-1633 (Nov. 9) 1940.

in treatment with sulfapyridine was three days, with a range of from two to eight days, and with sulfathiazole, three days also, with a range of from one to seven days. This early clinical response is more rapid than that obtained with local therapy alone. Second, it is our impression that complications are materially reduced in number and possibly in some cases actually prevented. There were no complications in our group of 105 cured patients.

In the 105 cases in which cure was effected the average dose of both sulfapyridine and sulfathiazole to effect a cure was 3 Gm. daily for eight days (table 2). Many authorities favor a higher initial dose with a reduction in three or four days, continuing thus to the completion of an eight to ten day course. The average total dose to effect a cure with sulfapyridine was 23.5 Gm., and with sulfathiazole 28 Gm. However, when studying the range of dosage requisite to produce cure, we found that it averaged for sulfapyridine from 2 Gm. daily for seven days (14 Gm.) to 3 Gm. daily for thirty-seven days (111 Gm.), and for sulfathiazole, from 3 Gm. daily for four days (12 Gm.) to 3 Gm. daily for twenty-eight days (84 Gm.).

From the outline of dosage just given it would seem that continuance of the drug beyond an eight to ten day limit is necessary in some cases. An alternative would be to change to some other sulfanilamide deriva-

TABLE 2.—*Dosage of Sulfapyridine or Sulfathiazole Required to Effect a Cure in Gonorrheal Urethritis in the Male: Analysis of One Hundred and Five Cases*

	Sulfapyridine	Sulfathiazole
Average dosage to effect cure.....	3 Gm. daily for 8 days	3 Gm. daily for 8 days
Range of dosage to effect cure.....	2 Gm. daily for 7 days to 3 Gm. daily for 37 days	3 Gm. daily for 4 days to 3 Gm. daily for 28 days
Average total dosage to effect cure...	23.5 Gm.	28 Gm.
Range of total dosage to effect cure..	12 Gm. to 111 Gm.	12 Gm. to 84 Gm.

tive. In cases of refractory gonorrhea we are of the opinion that two courses with a rest period between are therapeutically better than a long-continued course, and safer with respect to severe toxic reactions. In 3 of the 87 patients receiving sulfapyridine exfoliative dermatitis of varying degree developed.⁴ The course of treatment of each of these patients was protracted.

TOXICITY

Among ambulatory patients it has been customary to maintain lower doses than would be used if the patient were hospitalized. As a result, severe toxic reactions are experienced less often. This precaution is necessary because of the responsibility of patients at work, and because they cannot be under constant medical observation and because those driving vehicles cannot afford the risk of accidents as a result of vertigo and other symptoms.

Among 76 of the sulfapyridine-treated patients who returned to the clinic for two or more visits, mild toxic symptoms were experienced by 75 per cent. Among 52 of the sulfathiazole-treated patients who returned for two or more visits, mild symptoms were experienced by 11.5 per cent. The commonest symptoms for both groups were headache, nausea and vertigo (table 3).

4. LaTowsky, L. W.; Uhle, C. A. W., and Knight, Frank: Severe Toxic Skin Reactions Following Sulfapyridine Therapy, M. Times 69: 120-124 (March) 1941.

CRITERIA OF CURE

Chemotherapy has destroyed the value of the former provocative tests. Reliance cannot be placed on them, because the patient who has gone into a clinically negative phase under chemotherapy can be put through the

TABLE 3.—*Analysis of Symptoms of Toxicity in Response to the Administration of Sulfapyridine and Sulfathiazole*

	Sulfapyridine 76 Patients Returning to the Clinic for Two or More Visits		Sulfathiazole 52 Patients Returning to the Clinic for Two or More Visits	
	Number	Percentage	Number	Percentage
No complaints.....	19	25	46	88.5
Complaints.....	57	75	6	11.5
Headache.....	28	36.8	3	5.7
Nausea.....	13	17.1	2	3.8
Vertigo.....	3	3.9	1	1.9
Exfoliative dermatitis.....	3	3.9	..	..
Anorexia.....	2	2.6	..	..
Night sweats.....	1	1.3	..	..
Tinnitus.....	1	1.3	..	..
Lassitude.....	1	1.3	..	..
Chills.....	1	1.3	..	..
Pruritus.....	1	1.3	..	..
Vomiting.....	1	1.3	..	..
Diarrhea.....	1	1.3	..	..
Constipation.....	1	1.3	..	..

routine of provocation without having a response, despite the fact that smear and cultural studies still give positive results. This unhappy state of affairs is seen in more than 90 per cent of cases and can be demonstrated within the first week of treatment. The inadequacy of provocation throws the responsibility of detection on carefully performed smears and cultures of the urinary sediment and strippings of the prostate, the seminal vesicles and the urethra.

Bacteriologic work in the treatment of gonorrhea with the sulfonamides assumes the greatest importance, which it did not necessarily possess with the older forms of treatment. One realizes that not every physician will be able to give his patient the advantages of routine cultural work. It is suggested that the physician then employ the knowledge of bacteriologic concepts established by others and treat his patients to the end of and even beyond the average period of positive cultures. This treatment, of course, depends on the

TABLE 4.—*Analysis of Two Hundred and Forty-Eight Urethral or Prostatic Exudates Positive for the Gonococcus by Either Smear or Culture or Both*

Report of Laboratory	Exudates from Patients with Symptoms of Gonorrheal Urethritis Total: 135 Cases		Exudates from Patients Without Symptoms of Gonorrheal Urethritis Total: 113 Cases*	
	Number	Percentage	Number	Percentage
Positive smear, positive culture	107	79	0	..
Negative smear, positive culture	26	19.3	112	99
Positive smear, negative culture	2	1.8	1	1
Total positive cultures.....	133	98.5	112	99
Total positive smears.....	109	81	1	1

clinical state of the patient. The clearance of the urine and the disappearance of shreds are not reliable as an index of cure in the absence of smears and cultures. One cannot dispute the value of the observation, however, as a useful clinical guide.

SMEAR VERSUS CULTURE

Under chemotherapy the urethral discharge disappears in an average of three days. It is difficult after this time to obtain a positive smear, but culture of the

urine and secretions, when the proper technic and cultural mediums are used, is always positive for the gonococcus.⁵ The importance of culture over smear is shown in table 4, which analyzes 248 urethral and prostatic exudates.

On what basis should a statement of cure be made? From the evidence presented it should not be pronounced on the basis of the smear but on the basis of repeated sterile cultures, at least three, obtained at intervals of five to seven days. It is in order, therefore, that where the laws provide for the use of the smear in diagnosing the presence or absence of gonorrhea revision should be made to include the culture in every case.

CARRIER STATE

The carrier state is one of the most serious problems created by chemotherapy. The cessation of discharge in three days under active treatment with an active carrier state for several weeks thereafter is a menace to society. Sexual intercourse in the majority, acting similarly to the provocative tests mentioned previously, does not cause recurrence of discharge. Here, then, is a

TABLE 5.—Carrier State in Treatment of Gonorrheal Urethritis with Sulfonamides

	Analysis of 57 Cures with Sulfapyridine		Analysis of 48 Cures with Sulfathiazole	
	Average	Range	Average	Range
Time (in days) elapsing between the beginning of specific therapy and cessation of the discharge	3	2 to 8	3	1 to 7
Time (in days) from beginning of therapy with specific and appearance for the first time of a culture of prostatic fluid negative for the gonococcus.....	51	14 to 162	28	7 to 88
Time (in days) elapsing from disappearance of symptoms of gonorrheal urethritis to last culture of prostatic fluid positive for the gonococcus.....	17.7	2 to 50	17	3 to 53

vicious cycle, since it is possible that the asymptomatic carrier⁶ can transmit his sulfonamide-fast strains to a second person. The second person becomes an active carrier with the disease in the asymptomatic form. Transfer of the organism to his sexual partner may lead to clinical evidences of active gonorrhea.⁶

In the study of the sulfonamide-fast properties of the gonococcus during treatment with sulfapyridine and sulfathiazole we have defined the carrier state as follows: the time which elapses from the disappearance of symptoms of gonorrheal urethritis to the last culture of the prostatic fluid or the urine containing the secretions positive for the gonococcus (table 5). The carrier state for sulfapyridine averages seventeen and sevenths days, with a range of from two to fifty days,

while that for sulfathiazole averages seventeen days, with a range of from three to fifty-three days.

SOCIAL ASPECTS

The rapidity with which the symptoms disappear and the discharge ceases creates a false sense of security in the patient. This applies to both the ignorant and the indifferent patient. The physician must take time to explain to his patient the vagaries of chemotherapy, so that at all times a mutual bond of cooperation will exist. Through the proper approach to the patient, with tact, understanding and interest in his case, the percentage of default in clinic work should be materially reduced. Those whom the physician cannot hold can be made to cooperate through the efforts of a competent social service department. If the social service department fails, a reminder from the state department of health or the services of the police department will accomplish the necessary result.

It is of interest that in our series of patients, who were for the most part unintelligent persons, the defaulting decreased in direct proportion to the time taken to explain what we wished to accomplish. In the second place, enough medicine was given to last only to the time of the next visit. Third, segregation was impossible and good and bad results were communal knowledge. The high percentage of good results fostered a spirit of cooperation and faithfulness. Fourth, the social service department rendered valuable aid. Among the 87 patients treated with sulfapyridine there were 25 defaulters (28.8 per cent), compared to 5 defaulters (9 per cent) among 55 patients treated with sulfathiazole. The latter group was our second series.

CONCLUSIONS

1. Sulfapyridine and sulfathiazole are equally efficacious in the treatment of gonorrheal urethritis in the male.
2. Toxicity is manifested less with sulfathiazole than with sulfapyridine.
3. Sulfathiazole is the drug of choice in the treatment of gonorrhea.
4. It would seem that a combination of oral chemotherapy and local treatment is preferable.
5. Chemotherapy has altered our conceptions of the provocative tests.
6. The value of the culture over the smear should be stressed in pronouncing a patient cured.
7. A social menace is created by the asymptomatic carrier.

255 South Seventeenth Street.

5. A satisfactory cultural technic is that outlined and carried through on each patient in this study by Drs. H. A. and L. Shelanski of the Department of Zoology of the University of Pennsylvania: A swab moistened with sterile saline solution is used to collect the exudate from the urethra or the prostate. The swab is streaked on chocolate blood agar plates, which are then incubated in an atmosphere of 10 per cent carbon dioxide and an excess of moisture at a temperature of 37.5 C. for twenty-four to forty-eight hours. At the end of this period typical colonies are isolated and placed on chocolate blood agar slants. These slants are incubated under the same conditions as the plates. The culture on the slant is tested for purity by the Gram stain technic, and sugar tubes are inoculated. The sugar tubes, containing dextrose, maltose and mannite with a broth base, are incubated for twenty-four to forty-eight hours at 37.5 C. Gonococci ferment only dextrose, with the production of acid and no gas; they do not ferment the other sugars. The organisms from the chocolate blood agar slants are also tested by the alkali solubility test.

6. Smith, F. C.: The Gonorrhea Problem, editorial, Weekly Roster & M. Digest 36: 441 (Nov. 30) 1940.

Calcium and Phosphorus Shortage.—In young children, this may result in stunted growth, weakened or soft bones, and teeth which are malformed or decaying, since these two elements are essential to building new and healthy bone tissue. The same effects may follow if the mother's diet is lacking in these elements during pregnancy or while nursing her child, although she may draw on her own bones and teeth to supply the calcium and phosphorus needed for the bones and teeth forming in the child. The character of the bones and teeth is largely determined by whether an abundant supply of these two elements was available in prenatal life and during the first few years of postnatal life, though the bony structure of adults will suffer to a lesser extent when there is lack of either calcium or phosphorus over a sufficiently long period.—Bogert, L. Jean, and Porter, Mame T.: Dietetics Simplified, New York, Macmillan Company, 1940.

GONOCOCCIC CONJUNCTIVITIS

A COMPARISON OF SULFANILAMIDE, SULFAPYRIDINE
AND SULFATHIAZOLE IN THE TREATMENT OF
ONE HUNDRED AND TWENTY CASES

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In the past few years so many articles have appeared in the ophthalmic journals concerning the treatment of gonococcal conjunctivitis with sulfanilamide that one hesitates to burden the literature with any further reports. However, considerable difference of opinion still exists as to the best method of using the drug. While most observers have used the sulfonamides orally, several have reported their experiences with the drugs used locally in the eye. Rein and Tibbetts¹ employed a 0.5 per cent solution of sulfanilamide in physiologic solution of sodium chloride as an irrigation every fifteen minutes night and day. They reported good results in 15 cases, in which negative smears were obtained on an average of six and eight-tenths days. Panneton² has recently published an interesting account of treating this disease in 10 cases by the insufflation of the conjunctival sac with the powdered drug every three hours. In 8 he used powdered sulfanilamide and in 2 powdered sulfapyridine.

Bruens³ reported the local use of a sulfanilamide derivative called albucid on 3 infants with great success, claiming negative smears in twenty-four hours. He used the drug in a solution of from 10 to 30 per cent and dropped it on the everted conjunctiva of both upper and lower lids, after which he massaged the conjunctival surfaces together. This treatment was repeated every half hour. He also recommended irrigation with physiologic solution of sodium chloride every fifteen minutes. Pillat⁴ used the same preparation as a 10 per cent solution locally every thirty minutes in gonoblenorrhoea neonatorum. Irrigations with physiologic solution of sodium chloride every fifteen minutes day and night were also employed. He found that the gonococci disappeared from the conjunctiva in from twenty-four to forty-eight hours. Guyton⁵ reported treating gonococcal conjunctivitis in 1 instance with a 5 per cent sulfanilamide ointment every hour, but after twenty-four hours there was no improvement, so systemic chemotherapy was started.

We used in 2 cases of our series an 0.8 per cent solution of sulfanilamide locally after the method of Rein and Tibbetts.¹ No improvement was evident after twenty-four hours; therefore it was deemed inadvisable further to withhold internal medication.

Mengel⁶ demonstrated that ordinary doses of sulfanilamide given orally produce concentrations of from 1.5 to 3.2 mg. per hundred cubic centimeters in the aqueous and vitreous humors. When, however, the drug was

instilled in the conjunctival sac, absorption was poor, so that only traces, less than 0.1 mg. per hundred cubic centimeters, were present in the aqueous humor. While this indicates that the local use of sulfanilamide would be inefficient in intraocular infections, it does not imply that it might not work well for conjunctival involvement.

Most observers have used the drug orally but have reported only small series of cases. Thus Hageman,⁷ Heinemann⁸ and McKee⁹ each described their experience with 1 case. Fernandez¹⁰ and Newman¹¹ reported 8 cases and several other observers¹² smaller numbers. Barbour and Towsley¹³ reported 15 cases, as did Rein and Tibbetts¹ and also Michels.¹⁴ Bower and Frank¹⁵ reported their results in a series of 21 cases. Sysi¹⁶ used sulfapyridine in 11 cases with excellent results. Mullen¹⁷ in a recent article reported 42 cases at the Philadelphia General Hospital in which relatively large doses of sulfanilamide internally and the instillation of an 0.8 per cent solution locally every ten minutes day and night gave satisfactory results. There seems to be complete agreement among all who have used sulfanilamide and its related compounds in the treatment of gonococcal infections of the eye that they are of great value. However, since no one has previously published such a large series of cases or a comparison of the efficacy of sulfanilamide, sulfapyridine and sulfathiazole in gonococcal ophthalmia, it was thought that this report might prove to be of some value.

This paper is a brief account of the results obtained in the past four years in the isolation department of the John Gaston Hospital in Memphis. The first patient with gonococcal ophthalmia treated with one of the sulfonamides was in June 1937. Since that time all patients have been given the benefit of these drugs. To date (May 1941) a total of 120 patients have been treated. No patient is included in this series unless a gonococcal infection was definitely diagnosed, both clinically and bacteriologically. In most instances the gonococcus was demonstrated on each of two smears taken on admission and examined by different investigators. One smear was examined in the laboratory of the isolation department and the other in the main laboratory of the John Gaston Hospital. Numerous patients admitted with the diagnosis of gonococcal infection proved to have conditions due to other bacteria or to have inclusion body blennorrhoea and were therefore excluded from this series.

Until April 1, 1940 sulfanilamide was used in all cases. From April 1, 1940 to Feb. 1, 1941 sulfapyridine only was used. Since February 1 sulfathiazole has been employed.

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From the Department of Ophthalmology of the University of Tennessee College of Medicine.

Dr. Gilbert Levy, director of the isolation department, and the hospital staff assisted in this work.

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15. Bower, A. G., and Frank, W.: *Am. J. Ophth.* 22:277 (March) 1939.

16. Sysi, R.: *Acta ophth.* 17:466, 1939; abstr. *Am. J. Ophth.* 23:1188 (Oct.) 1940.

17. Mullen, Carroll R.: *Treatment of Gonorrheal Diseases of the Eye with Sulfanilamide*, *Arch. Ophth.* 25:655 (April) 1941.

TREATMENT

The usual routine at the Isolation Hospital is as follows: As soon as a patient is admitted smears are taken for examination, and if the patient has the clinical appearance of having a gonococcic infection, treatment with one of the sulfonamides is started at once. When sulfanilamide was used, an initial dose was given of from $\frac{1}{3}$ to $\frac{1}{2}$ grain (0.02 to 0.03 Gm.) per pound (454 Gm.) of body weight, according to the severity of the case. In the newborn approximately $\frac{1}{2}$ grain per pound of body weight was given, and occasionally a slightly larger amount if the infection seemed unusually severe. A dose was given every four

This may be as low as 4 mg. per hundred cubic centimeters in cases of mild involvement to 11 mg. in those of severe involvement.

In our own series we have not made a practice of determining the blood concentration of the drug. The patients have responded rapidly to moderate doses. In adults usually the initial dose of 30 to 60 grains (2 to 4 Gm.) and an average of about 15 grains (1 Gm.) every four hours thereafter has produced such a decided improvement that the dose could be reduced or discontinued in from thirty-six hours to four days. In our experience it has been unnecessary to continue sulfapyridine more than twenty-four hours after the con-

TABLE 1.—Sulfapyridine Treatment

Case	Age of Patient	Eye Involved	Duration Before Admission	Apparently Cured	Days in Hospital	Corneal Involvement	Visual Results	Total Dose of Sulfapyridine	Blood Changes
1	20 years	O. D.	2 days	2 days	5	None	Unimpaired	270 grains	None
2	3 days	O. U.	1 day	2 days	5	None	Unimpaired	18 grains	None
3	11 days	O. U.	6 days	36 hours	4	None	Unimpaired	24 grains	None
4	17 years	O. U.	3 days	3 days	6	None	Unimpaired	360 grains	None
5	20 years	O. S.	2 days	4 days	6	None	Unimpaired	375 grains	None
6	6 years	O. S.	3 days	3 days	5	None	Unimpaired	180 grains	None
7	4 days	O. U.	1 day	2 days	4	None	Unimpaired	35 grains	None
8	6 years	O. D.	6 hours	2 days	4	None	Unimpaired	138 grains	None
9	8 days	O. U.	2 days	1 day	3	None	Unimpaired	21 grains	None
10	8 days	O. S.	1 day	1 day	3	None	Unimpaired	21 grains	None
11	6 years	O. U.	2 days	3 days	5	None	Unimpaired	180 grains	None
12	3 years	O. S.	1 day	1 day	3	None	Unimpaired	85 grains	None
13	40 years	O. U.	7 days	8 days	10	Ulcer on admission	Unchanged	645 grains	None
14	21 days	O. U.	4 days	3 days	4	None	Unimpaired	35 grains	None
15	8 days	O. D.	3 days	3 days	6	None	Unimpaired	27 grains	None
16	21 years	O. S.	1 day	1 day	4	Old scars	Unchanged	330 grains	None
17	3 months	O. U.	7 days	2 days	5	None	Unimpaired	53 grains	None
18	13 days	O. U.	6 days	4 days	7	None	Unimpaired	30 grains	Slight Hb. reduction
19	8 days	O. U.	5 days	3 days	5	None	Unimpaired	38 grains	None
20	4 days	O. U.	1 day	4 days	5	None	Unimpaired	39 grains	None
21	3 years	O. U.	4 days	1 day	3	None	Unimpaired	55 grains	None
22	15 days	O. U.	Unknown	5 days	8	Ulcer on admission	Unchanged	38 grains	None

TABLE 2.—Sulfathiazole Treatment

Case	Age of Patient	Eye Involved	Duration Before Admission	Apparently Cured	Days in Hospital	Corneal Involvement	Visual Results	Total Dose of Sulfathiazole	Blood Changes
1	21 days	O. U.	4 days	5 days	7	None	Unimpaired	58 grains	None
2	2 years	O. U.	6 days	4 days	5	None	Unimpaired	85 grains	None
3	15 days	O. D.	4 days	4 days	8	None	Unimpaired	96 grains	None
4	4 years	O. D.	3 days	3 days	5	None	Unimpaired	188 grains	None
5*	12 days	O. U.	8 days	9 days	11	None	Unimpaired	64 grains	None
6	26 years	O. S.	2 days	2 days	3	None	Unimpaired	200 grains	None
7	5 days	O. D.	3 days	3 days	5	None	Unimpaired	23 grains	None
8†	4 years	O. U.	2 days	2 days	4	None	Unimpaired	85 grains	Slight leukopenia

* Not cured after eight days' treatment; changed to sulfapyridine; well in thirty-six hours.

† Sodium sulfathiazole 5 per cent solution instilled every two hours; severe attack with rapid recovery.

hours thereafter in an amount sufficient to give a daily total of from $\frac{1}{2}$ to $1\frac{1}{2}$ grains (0.03 to 0.08 Gm.) per pound (without counting the initial dose). Usually this dose was continued five or six days or until significant clinical improvement and negative smears indicated that the drug might be reduced or stopped.

Somewhat smaller doses of sulfapyridine are given, about $\frac{1}{3}$ grain per pound for adults and a little less than $\frac{1}{2}$ grain per pound for infants as the initial dose. Absorption of sulfapyridine is not nearly as definite as is that with sulfanilamide. Long and Bliss¹⁸ and other observers have noticed individual variations in the capacity to absorb this drug. They recommend basing the dose on the amount required in the individual case to produce the desired blood concentration of the drug.

dition is cured clinically and bacteriologically. There have been no relapses with sulfapyridine.

Our experience with sulfathiazole in this condition has been very limited. We have used doses approximately the same as or slightly larger than we employed with sulfapyridine. With this drug both absorption and excretion are more rapid than with the other two, so the daily dose should always be divided and administered every three or four hours in order to maintain the proper blood concentration. With our few cases the time required for a "cure" was longer and the hospitalization longer than with sulfapyridine. Furthermore, 1 case (5 in table 2) showed only slight improvement on the eighth day of treatment. A change to sulfapyridine produced a cure in thirty-six hours. We therefore feel at present that sulfapyridine is somewhat superior to sulfathiazole in the treatment of gonococcic conjunctivitis.

18. Long, P. H., and Bliss, Eleanor A.: The Clinical and Experimental Use of Sulfanilamide, Sulfapyridine and Allied Compounds. New York, Macmillan Company, 1939, p. 236.

Besides specific chemotherapy, I use and recommend the following routine:

1. Mechanical cleansing of the conjunctival sac every four hours by irrigating with cool boric acid solution.
2. Instillation of 25 per cent mild protein silver after the irrigation.

3. Iced compresses in cases in which there is considerable edema of the eyelids and conjunctiva.

4. Discontinuance of this treatment as soon as the eye is clean clinically and the smears are negative. This occurs usually in from twenty-four to seventy-two hours. Following this, zinc sulfate, 2 grains (0.13 Gm.) per ounce (30 cc.), is instilled three or four times a day and continued for about one week after the patient leaves the hospital.

Atropine is not used unless there is corneal involvement. No scarification of the conjunctiva, external canthotomy or foreign protein injections have been necessary since sulfapyridine and sulfathiazole have been used. In a few cases in which sulfanilamide was given, the response to treatment was poor and therefore injections of milk or of typhoid vaccine were administered. The application of silver nitrate solution to

By inspection of table 3 it is obvious that the use of sulfanilamide constitutes a distinct advance in the treatment of gonococcic infections of the eye from the point of view both of preservation of vision and of rapidity of cure. From the same points of view it is apparent that treatment with sulfapyridine is far superior to that with sulfanilamide, the average number of days required for a cure being reduced to less than one half of the number necessary for sulfanilamide. The period of hospitalization was reduced to slightly more than one half. While our experience with sulfathiazole has been too limited to permit the drawing of definite conclusions, it is felt at present that it is not as rapid in action as sulfapyridine but definitely superior to sulfanilamide. Usually it is better tolerated than sulfapyridine.

TOXIC REACTIONS AND CONTRAINDICATIONS

It is unnecessary in cases of gonococcic conjunctivitis to give enormous doses of sulfonamides. Therefore it is seldom that severe toxic reactions occur. In this series of 120 patients there was only 1 who had a severe reaction, and he was given too large an amount of the drug (initial dose 120 grains [8 Gm.] of sulfanilamide and 20 grains [1.3 Gm.] every four hours thereafter).

Nausea is rather frequent, especially from sulfapyridine, and slight or moderate cyanosis is not uncommon. These reactions usually do not necessitate discontinuance of the drugs.

Serious blood changes have not been encountered in our series. Moderate reduction in hemoglobin and red blood cells has occurred in several cases. Severe leukopenia or acute agranulocytosis has not occurred.

There have been no contraindications to systemic sulfonamide therapy in our series of cases. We believe that there are no contraindications in gonococcic conjunctivitis unless the patient gives a history of definite intolerance to a previous administration of the drugs.

SUMMARY AND CONCLUSIONS

One hundred and twenty patients with gonococcic conjunctivitis were treated with the sulfonamides.

Toxic reactions, with the exception of 1 case early in the series, were practically negligible. Nausea occurred frequently, especially with administration of sulfapyridine. Slight cyanosis was rather common. In very few cases were there any significant changes in the blood cell counts or in the hemoglobin.

There seems to be no contraindication to the systemic use of the sulfonamides except a definite history of previous intolerance to the drugs.

Sulfapyridine is amazingly effective in the treatment of gonococcic infections of the eye. Sulfathiazole is apparently somewhat less effective. Both are definitely superior to sulfanilamide. A cure may be expected within three days, as a rule, from the time sulfapyridine treatment is begun.

My limited experience with local treatment by the sulfonamides leads me to the conclusion that it does not compare favorably with the internal use of the drugs. Recently a 5 per cent solution of sodium sulfathiazole instilled locally every two hours has been tried along with the usual dose of sulfathiazole internally. Apparently it is of definite value.

Every patient with gonococcic conjunctivitis should immediately be given adequate systemic treatment with sulfapyridine or sulfathiazole.

130 Madison Avenue.

TABLE 3.—Comparison of Results With and Without Sulfonamides

	Number of Cases	Average Number of Days for Cure	Average Number of Days in Hospital	Unsatisfactory Results*
Presulfonamide therapy.....	50	17.3	20.3	18 †
Sulfanilamide.....	90	5.4	8.9	8 †
Sulfapyridine.....	22	2.57	4.85	0
Sulfathiazole.....	8	4.0	6.0	1 §

* Visual damage from corneal ulceration, relapses and very slow clinical and bacteriologic cures are placed under this heading.

† Corneal ulceration 11 cases; delayed recovery (over three weeks) 7 cases.

‡ Corneal ulceration 1 case; delayed recovery (over three weeks) 4 cases; tolerated drug poorly 1 case; relapse 2 cases.

§ Only slightly improved on eighth day; changed to sulfapyridine.

the everted conjunctiva, which was formerly employed frequently, has been unnecessary since treatment with the sulfonamides has been employed.

REVIEW OF RESULTS

The success of any method of treatment of gonococcic ophthalmia should be judged by two standards:

1. The preservation of vision, which means the prevention of ulcers of the cornea, or the healing of ulceration which may have already occurred.

2. The rapidity and ease with which complete recovery occurs.

Obviously the first standard is the more essential, but the second is of great importance both from the standpoint of shortening the patient's period of disability and from that of great economic saving. Prior to use of the sulfonamides, patients were confined to the hospital for a much greater length of time. They also required much more frequent attention; for example, irrigations every fifteen or thirty minutes day and night, as were commonly employed, frequently required the entire attention of one or more special nurses. Prolongation of this over two or more weeks, as was not uncommon, obviously was very expensive. Comparison of this with modern therapy by sulfapyridine or sulfathiazole, with which the patient requires very little local treatment and leaves the hospital fully recovered in less than seven days, shows the great superiority and the economic saving obtained by the latter method.

SYMPOSIUM ON MEDICAL PREPAREDNESS

The articles which follow are the remainder of a series read at the annual session of the American Medical Association in Cleveland, June 3, 1941. The other five articles in this series were published in The Journal last week.

PROCUREMENT OF MEDICAL PERSONNEL AND MATÉRIEL IN THE PRESENT EMERGENCY

JAMES C. MAGEE, M.D.

Major General, United States Army;
The Surgeon General

WASHINGTON, D. C.

I appreciate the opportunity afforded me this afternoon to express my sincere thanks for the splendid cooperation and support rendered by the Committee on Medical Preparedness of the American Medical Association in the furtherance of the national defense program and to inform you of some of our problems and the action we are taking to solve them in a proper and judicious manner.

As physicians and citizens, you have given proof of your interest in national defense. The security of our country is the paramount issue in all our lives today, and everything else must be subordinated to the accomplishment of this purpose. There must be no moral or physical hesitancy until the adequacy of our preparedness insures the national safety of our people.

MEDICAL PERSONNEL PROBLEM

Our problem is not only of securing personnel in order to furnish an adequate medical service to an unprecedented peacetime army but of training approximately 60,000 Medical Department selectees who, at the expiration of their twelve months military service, will pass to a reserve component and constitute a reservoir of trained personnel required for any emergency. We have provided for a rational utilization of medical officers in order not to disrupt civilian medical service, although in the necessary decentralization of personnel procurement some injustices may have resulted. It is our sincere purpose to avoid these to the greatest possible extent.

Our national defense program as now outlined has required in addition to the 1,230 medical officers of the Regular Army approximately 9,000 physicians for the Army, 900 for the Navy, 100 for the Public Health Service and 100 for the Veterans Administration, or a total of 10,000 in addition to present staffs. Computations for Medical Department Reserve officers requirements for the 1942 training and service program indicate that we shall need for the Army alone 9,020 Medical Corps and 1,992 Dental Corps reserve officers. These figures are based on an army of 1,400,000. This reduction in available doctors for civilian practice together with the increased demand for medical care in the field of industrial medicine due to the growth of communities throughout the country, through the establishment of new defense industries and their associated health problems imposes a regrettable burden on all of you. This will produce an increased demand of an estimated 10 per cent of physicians (5 per cent for the withdrawal from civilian practice for our armed forces and another 5 per cent for the increased demands enumerated in industrial medicine).

The fact that our supply of medical men is not distributed in accordance with population, thus creating shortages in one area and overages in another, has added to our problem. The 5,000 medical graduates currently entering the profession each year represent the only source of supply for our future civilian and military needs. When it is realized that approximately 18 per cent of the nation's physicians are 65 years of age or older, that 3,800 are lost to the profession each year and that experience has shown that only from 60 to 65 per cent of medical graduates are physically and otherwise qualified for military service, the supply is inadequate. Except for those who have agreed to serve an additional year prior to detail to foreign service, our Medical Reserve officers are not continued on extended active duty for a period longer than twelve consecutive months without their consent. If an estimated 50 per cent terminate their service each year, it will mean that we need 4,500 Medical Reserve officers for our yearly requirements as replacements.

From these figures it is apparent that there is an over-all and national shortage of physicians both for civilian needs and for our armed forces. We have proved our point with those concerned with manpower that no replacement is available for the medical student withdrawn from school and that inducting any of those students for service in a nonprofessional capacity only aggravates our shortage. Since the internship is an essential part of the medical education, the situation also holds for this necessary additional training.

To meet these problems we have attempted to rationalize our policies to fit our requirements, keeping in mind the national picture and at the same time to mitigate as far as possible the individual hardships of those called to serve in the Army.

Our efforts to this end have been unceasing, and on May 2 the Selective Service System recommended to all its state directors that no student or intern who gives reasonable promise of becoming an acceptable medical doctor should be called to military service prior to attaining that status. On the recommendation of my office, the Secretary of War published instructions that a Medical Reserve officer is not considered eligible for extended active duty until he shall have completed at least one year postgraduate hospital internship. Deferment of such duty beyond that time will depend on the current requirement for medical officers. Because of our continuing training program it may be necessary to postpone longer internships, residencies and postgraduate work until the obligation of military training has been discharged.

An opportunity has been provided for all senior students of American schools approved by the Council on Medical Education and Hospitals of the American Medical Association on successful completion of the required four year course to gain commissions as first lieutenants in the Medical Corps Reserves, whether or not a degree of doctor of medicine is conferred at that time or withheld until after an additional period of practical experience. Consequently even though a local

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board places an intern in class I-A by reason of determining that he can be spared from the community, such intern may by proper reclassification and on accepting an appointment in the Medical Corps Reserve be permitted by the War Department to complete his first year's internship. In this connection, if applications are not properly submitted for appointment and the applicant is selected for induction, considerable time may elapse before the appointment may be accomplished. To assist the individual officer in closing out his personal affairs, assignment groups have been ordered by the War Department to anticipate the effective date of the order by at least a month to provide adequate notice between the date of receipt of their orders and the date on which they enter on active duty.

In event of mobilization necessitating an immediate material increase in the Medical Corps, we will have available the names of applicants for appointment therein who are eligible, qualified, classified and available for immediate active duty without undue disruption of civilian medical service. This has been accomplished as a result of the nationwide survey of the medical profession conducted by the Committee on Medical Preparedness of the American Medical Association, a contribution of incalculable value both for civilian medical service and for our military requirements. Although the procurement of medical personnel constitutes a real problem, if we make judicious use of our pool of doctors and are successful in convincing the medical profession that a real emergency does in fact exist I am sure we can make adequate provision for both our civilian and military needs if our medical students are permitted to continue their studies without interruption.

PROCUREMENT OF MATÉRIEL

The building of our own defenses to adequacy and supplying the many and varied requirements of other democracies is a task of sufficient magnitude to dominate all other activities.

The Medical Department is properly charged with the procurement and distribution of medical supplies for the entire Army. These supplies may be placed in two general classes: first, those items necessary for the routine care of the sick similar to those utilized in civilian medical and hospital practice, commercial in nature, and whose rate of consumption varies directly with the size of the Army, and, second, field equipment consisting largely of items and assemblies adapted primarily for emergency treatment and evacuation of battle casualties, largely noncommercial in nature but whose rate of consumption varies from a negligible quantity in peace time to astronomical proportions during actual combat.

In 1924, in compliance with the National Defense Act, there was established a division of the War Department called Procurement Planning. For the Medical Department, centralized control of this function is directed by the Finance and Supply Division. Planning initiated at this time has been a continuing process, because of constant revisions necessitated by changes in type of equipment, revisions in War Department mobilization plans and in the productive capacity of the various manufacturers. The detailed work has actually been performed under seven procurement planning districts in the field located according to the center of industrial population, and officers from the Medical Department are trained in the Army Industrial College and in the various sections of the Supply Division for these duties.

The proper study of the supply requirements of the Medical Department and of industry's ability to meet such requirements in a national emergency is known as procurement planning and has been of inestimable value in providing a sound basis for the procurement of the necessary supplies in our present expansion program. Representatives of my office have maintained contact with industry and have surveyed all the most important plants now producing medical supplies. Through these surveys we have become better enabled to standardize our equipment, write more satisfactory specifications and in general obtain a more complete understanding of industry's production problems.

For several years the Medical Department has had basic equipment lists covering supplies to be packed for field assemblies such as battalion medical sections and medical regiments. Lists have also been prepared during the past year for station hospitals of from twenty-five to two thousand bed capacity, thus simplifying paper work and time for assembly and issue. We have of necessity made industrialists of certain medical officers in order that they might more correctly speak the language of industry and in time of emergency assist in the elimination of those processes which curtail production. Our surveys of industry have convinced us that there is adequate production capacity in our country for the fabrication of our needs.

We have heard much of America's mass production and are convinced that our industry is capable of producing anything under the sun, regardless of its size, shape or function. We have so convinced ourselves of its infallibility that we have relaxed into a sense of security which is not entirely warranted. The national press should have made us conscious by now of the time lag required for fabricating machine tools for production, the difficulties connected with raw and contributing material requirements, and those many problems incident to the training of the necessary industrial workers. Drugs and chemicals are in many instances wholly or partially dependent on imports. Studies have been made relative to the use of substitutes, where possible, and in other instances stock piles have been recommended and now exist in opium, mercury and quinine. The Department of Agriculture is also introducing and cultivating some of the suitable botanicals domestically.

Skilled workers and apprentices are being trained as rapidly as possible through the efforts of the super-agencies established by the President under the National Defense Act in cooperation with my office.

The difficulty encountered in the manufacturing of surgical dressings is due to the considerable needs of the British government and the American Red Cross, added to the increased requirements of our Army and Navy. There are sufficient looms for the manufacture of the gray goods, but owing to the fact that these same looms may be used in the manufacturing of more costly and lucrative textiles the production has not reached the adequacy we desire. Bleachery capacity has also been one of the "bottlenecks" adversely affecting this production.

The raw materials which are at the present controlled by the Office of Production Management because of their potential scarcity consist of such items as aluminum, nickel, brass and rubber and a few others. Probably the greatest difficulty that has confronted us in our various matériel problems has been in the procurement of the so-called hard or stainless steel surgical instruments.

In 1915-1916 the surgical instrument industry first became prominent in the United States as the result of our inability to secure further German imports. During the World War this was a thriving business in our country, but following the cessation of hostilities the industry dwindled to about three concerns. Again the German, French, Swedish and English instruments had preference in this country, owing to the price differential. We have demonstrated unquestionably that we can manufacture as good an instrument as any country, but we have not been able to furnish real competition in this field, owing to the cost of materials and labor. Through the encouragement of my office, we are today manufacturing certain surgical instruments of high quality in some of our leading silverware concerns.

Many problems have arisen in the manufacture of sterilizers and roentgen ray equipment because of the present shortage of basic materials and the necessity for priority ratings.

I should like to stress the point here that, although preference ratings have been granted on certain items essential to the Medical Department in its defense program, my office has gone on record as requesting the extension of priorities on all items required in the maintenance of our national health and the proper treatment of the sick and injured. Favorable results are shown in the rulings on aluminum and nickel whereby items required for the health of the nation have been given a moderately high preference rating.

The actual work of procurement and distribution of supplies, although controlled by the Office of the Surgeon General, is decentralized to medical depots where purchases are made and where supplies are stored and issued to the using agencies. At the present time the Medical Department has seven active depots in the United States located at New York, St. Louis, San Antonio, San Francisco, Chicago, Savannah and Toledo, and also three reserve depots. It has been necessary to lease additional space for the first four depots named, and over one and one-half million square feet of space was leased to activate the last three depots.

I would stress these points, namely, that although many problems in procurement of matériel have arisen, I am sure that, when industry hits its stride, production will be ample for our needs as well as for those of the democracies we are aiding; that proper planning has mitigated our procurement difficulties to a considerable degree, and of my assurance to you that my office through its procurement planning section will always give every consideration to civilian medical matériel requirements.

CONCLUSION

Your realization and thorough understanding of the magnitude of our problem and the tangible expression of your desire to see it accomplished as evidenced by the manner in which you have met its challenge is most encouraging. There is much work yet to be done, however, and I have specified some of our problems. A continuation of the same commendable effort and cooperation already contributed by you will be of incalculable value to our nation and will once again assure the people that the medical profession now stands, as always, in the forefront of the country's defenders.

Office of the Surgeon General.

VENEREAL DISEASES AND NATIONAL DEFENSE

JOSEPH EARLE MOORE, M.D.

BALTIMORE

Venereal disease has been the concern of the United States Army and Navy at least since 1778. In this year Congress provided that any officer should be fined \$10 and any enlisted man \$4 who should be admitted to a hospital with such a disease. Aside from the purely medical measures of treatment of infected personnel, various other control steps have since been taken, including (1) a continuation of the policy of punishment for infection, differing in severity from time to time but still including (by acts of Congress, 1912 and 1914 and 107th Article of War) loss of pay and loss of time for disease acquired "as a result of misconduct,"¹ (2) periodic physical inspection of personnel (1899), (3) the provision of recreational facilities (1909), (4) chemical prophylaxis (1909) and later mechanical prophylaxis, (5) educational measures (1909), (6) official recognition of responsibility of unit commanders for high venereal disease incidence (1923), (7) the routine serologic testing for syphilis of all draftees and other personnel (1940), and (8) adherence to an agreement between the War and Navy Departments, the Federal Security Agency and state health departments particularly affirming the value of the epidemiologic approach to case finding, and of repression of prostitution (1940).

VENEREAL DISEASE INCIDENCE IN THE ARMED FORCES IN WAR AND PEACE

Its Relation to Medical Organization.—The data covering venereal disease incidence in the United States Army cover four wars.² During the first three of these, the Mexican, Civil and Spanish wars, and in the years between them, no special measures for venereal disease control were undertaken. In each of them, the annual incidence rate per thousand of strength approximately doubled, to fall back after demobilization to an average of about 80 per thousand annually. After the Spanish-American War the peace time drop was delayed about ten years and was to a somewhat higher level, about 90 to 100 per thousand.

In World War I, on the contrary, specially trained venereal disease control officers were called into Army service in large numbers. In the American Expeditionary Force in France no less than two hundred and forty-six officers were assigned to this duty, among whom were six colonels, seven lieutenant colonels, twenty-four majors, eighty-five captains and one hundred and twenty-four first lieutenants. Not all of them were on duty at any one time, but there was a rough proportion of one military venereal disease control officer to each ten thousand of troop strength. The organization and work of this group, brought into being by the energy and vision of Major (later Col.) Hugh H. Young, is described monographically by Walker³ and

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1. Dunham, G. C.: Venereal Diseases in the American Army, Army M. Bull., July 15, 1923, p. 152.

2. Report of the Surgeon General of the Army, 1938.

3. Walker, George: Venereal Disease in the American Expeditionary Forces, Baltimore, Medical Standard Book Company, 1922.

in racy autobiographical fashion by Young himself.⁴ Less completely documented details are available as to the similar but apparently more loosely knit venereal disease control organization in the Army in the continental United States, but from the memories of participants it appears that at least two hundred and forty specially trained officers were so assigned, in the Surgeon General's Office, in each of the thirty-two large camps and in cooperation with the civilian authorities, mainly in law enforcement activities.

This concentration of venereal disease control effort was productive of a result not attained in any previous war. The incidence rate rose briefly from its average prewar level of 90 to about 110 per thousand; but thereafter, and actually during the course of the war, it fell to about 60. Instead of doubling under wartime conditions, as always previously, it nearly halved.

In the Navy too the incidence rate fell during the three years of the World War period from its previous ten year average of about 150 per thousand to an average of 90.⁵

Even this spectacular result was, however, a relative achievement only. During the thirty-three month period of World War I, April 1, 1917-Dec. 31, 1919, there were reported in the United States Army 483,717⁶ and in the Navy 57,146 cases of freshly acquired or freshly discovered venereal disease. These accounted in the two services for 7,492,610 lost man days, the equivalent of the absence from duty of 21,000 men for one full year.⁵ At least 11 per cent of the mean annual strength of both services were infected at enlistment or became so during their comparatively short period of service. The records are admittedly incomplete, and the 540,863 known cases in the two services represent the minimum, not the actual, incidence.

After World War I the venereal disease control groups of specially trained officers were demobilized. Again venereal disease became the concern of every medical officer in general, and therefore of nobody in particular. Nevertheless the rate in the Army continued to fall until in 1939 it had reached the all time low of about 31 per thousand, and in the Navy, following a preliminary rise after the war, it had fallen in 1939 to 85 per thousand. However, there is reason to believe that the current low premobilization rates are at least in part artificial and in part a reflection of some decline in the civil population.

LOW VENEREAL DISEASE RATES IN THE ARMED FORCES

Their Relation to Punitive Measures.—The probable artificiality of venereal disease incidence rates in the Army and Navy, not only now but for a century and a half, is a troublesome problem. The difficulty is not so much from the biostatistical point of view, since this is perhaps unimportant in that trends of infection are determined with as much validity from incomplete as from complete data, provided the fault accounting for incompleteness remains constant. Much more important are the possible reasons accounting for the artificiality, if it exists, and their impact on the further

spread of disease. There is evidence that punishment of an infected soldier or sailor, whether by loss of pay for loss of time or by other more drastic means, leads to concealment of disease from military or naval sources of treatment and to self treatment, drugstore treatment or treatment (often inadequate) by civilian physicians. Disciplinary action against unit commanders because high venereal disease rates may be interpreted as lax discipline in their units may lead to connivance by these commanders at concealment of infection in enlisted personnel or even insistence on it. The interpretation of infection as "due to misconduct" overlooks the fact that many, perhaps the majority, of soldiers and sailors are "guilty" of the same misconduct but are not punished or punishable because fortunate enough to escape infection. In other words, the Army and Navy are still chargeable with the point of view which stigmatizes venereal infections as sins rather than as diseases, a point of view which civilian experience has repeatedly shown promotes concealment of infection and therefore its continued and undercover spread.

Military and naval personnel acquire venereal disease, obviously, from the civilian population, and the Army and Navy are therefore thoroughly justified in insistence on heightened effort at venereal disease control among civilians. But soldiers and sailors also spread these diseases to civilians, and the public is likewise justified in asking that the Army and Navy take vigorous action also. The armed forces may profit by the experience of society in general and by the adoption of the principle that venereal disease is not controlled by punishment. It is desirable, therefore, that disciplinary measures be abolished, by regulation where possible, by act of Congress where necessary.

Likewise contributing to concealment of disease is the long-standing policy in both the Army and the Navy of requiring hospitalization for fresh uncomplicated infections with syphilis and gonorrhea. The period of hospital confinement varies at the discretion of the medical officer but is rarely less than ten days and may exceed several months. This procedure is unnecessary for medical reasons, since the patient is not usually ill either from his disease or as a result of treatment for it, since quarantine for the protection of others may be so brief as to be measured in hours or at most a few days, and since technically these diseases are as easily treated on an ambulatory as on a hospitalized basis. In both services, and especially in the Navy, there are important administrative considerations which demand that the policy be continued for some, perhaps for most, infected personnel. Where it is essential, the period of hospital stay might profitably be reduced to the barest possible minimum in order to conserve man power, to minimize expense to the services and thus indirectly to the taxpayer, and to minimize the punitive feature of loss of pay for loss of time to the patient. In this connection, furthermore, an intangible but none the less real punitive measure is added if infected personnel are stigmatized among their comrades by segregation in special "venereal wards." A compromise between the exigencies of the services and the public health objection that the policy of hospitalization promotes concealment of disease and therefore its spread might be furthered if such patients were managed without segregation and if the length of hospital stay for the average uncomplicated case was limited to ten days.

4. Young, H. H.: *Hugh Young, A Surgeon's Autobiography*, New York, Harcourt Brace & Co., 1941.

5. Stephenson, C. S.: *The Naval Medical Officer's Public Health Activity with Special Reference to National Defense*, South. M. J. 24: 90 (Jan.) 1941.

6. *The Medical Department of the United States Army in the World War* 9: 263, 1928.

This is a time period adequate to cure the majority of cases of gonorrhea and to initiate treatment for syphilis and to render it noninfectious. Whenever local circumstances permit, the administration of treatment on an ambulatory basis, the patient remaining on active duty, is highly desirable, most of all for conservation of man power.

DECLINE OF VENEREAL DISEASE INCIDENCE IN
THE ARMED FORCES, PERHAPS A PARTIAL
EXPRESSION OF LIKE DECLINE IN
THE CIVIL POPULATION

The decline in venereal disease incidence in the Army and Navy (in the former beginning in 1920 and in the latter in 1931) may reflect in part some similar decline in the civil population. This decline apparently began from twenty to twenty-five years ago but has been enormously accelerated in the past five years. It is measurable in many ways, perhaps the best of which for military purposes is the material decrease in the prevalence of syphilis in selectees in 1940-1941 as compared with its prevalence in drafted men in 1917-1918.⁷

METHODS OF VENEREAL DISEASE CONTROL IN THE
CIVIL POPULATION AND THEIR APPLICABILITY
TO THE ARMED FORCES

Unquestionably the greatest single factor accounting for the decline of venereal disease in the civil population is the control organization built up through the United States Public Health Service in cooperation with state and local health departments. Since 1918 the Public Health Service has had a separate Division of Venereal Diseases to which on Dec. 31, 1940 were attached three hundred and twenty persons (thirty-one commissioned medical officers, two hundred and eighty-nine noncommissioned personnel). Each of the forty-eight states and the District of Columbia has created (most of them within the past five years) within the state health department a division or subdivision of venereal disease control headed by a full time, usually specially trained venereal disease control officer with auxiliary personnel; and this example has been followed by practically every municipality in the country of five hundred thousand population or over. Exact data as to the number of persons devoting full time to venereal disease control in the civil population are not available, but it is a fair estimate that at least one hundred state and local health departments possess such divisions.

It was early recognized that the public health approach to venereal disease control demanded, on the one hand, a thorough knowledge of the principles of public health and an adequate working knowledge of the clinical manifestations of venereal disease. These two complementary points of view are essential because of the fact that, unlike all other communicable diseases, the control of this particular group depends on the cornerstone of treatment of the individually infected person plus the equally fundamental public health principles of case finding and case holding. It was necessary to create such a group of specially trained physicians from the ground up, a task which is still proceeding.

In their creation and development, special public health technics have been worked out, now so elaborate as to justify monographic presentation (by Nelson⁸).

7. Preliminary findings of an analysis by the U. S. Public Health Service; actual comparative figures not yet available.

8. Nelson, N. A., and Crain, Gladys L.: *Syphilis, Gonorrhea and the Public Health*, New York, Macmillan Company, 1938.

These technics, together with the enormous expansion of civilian treatment facilities, are the factors which have brought about the decline of venereal disease in the population as a whole.

In other words, the civil public health authority has finally learned its lesson: that as long as venereal disease control is the job of every public health officer and of every civilian physician it is the job of nobody and results are invisible. When, on the other hand, it becomes the sole responsibility of specially trained medical and auxiliary personnel, results become apparent at once.

The Army and Navy have also given recent recognition to this point of view. Each service has now created, within the offices of its respective Surgeon General, subdivisions of venereal disease control under the divisions of preventive medicine. The immediate and pressing need of these new subdivisions is medical personnel specially trained in the public health and clinical aspects of venereal disease control. It is desirable that there be furnished, as a minimum organization, venereal disease control officers for each corps area and naval district, and for each troop, naval or marine concentration of ten thousand or more men; and, in addition, officers with clinical experience in the venereal diseases for each hospital of five hundred or more beds.

The procurement of this personnel under present mobilization conditions is one of exceptional difficulty. Adequately trained potential reserve officers in the currently acceptable age group (under 35) are mostly already employed in civilian public health departments; to call a large proportion of them into military or naval service would grossly interfere with the progress of the civilian public health programs for venereal disease control and thus adversely affect the Army and Navy themselves. To commission older civilian physicians with this or other special experience is at present difficult if not impossible. To provide special training for officers of the regular medical corps of either service is out of the question, since they are themselves urgently needed for the vital administrative and special professional duties of mobilization. To train reserve officers called to duty for only one year is wasteful and unprofitable, since too much time is required for training and too little left over for its application.

The impasse is one which must affect not only the problem of venereal disease control but other specialized medical service problems as well. The solution appears to lie in the direction of organized personnel planning between Army, Navy, Public Health Service, state and local health departments and the American Medical Association to the end that every American physician may be assigned to that position of service to his country in its grave emergency for which he is best fitted by physical and professional qualifications.

DUTIES OF THE VENEREAL DISEASE CONTROL
SUBDIVISION

Given basic personnel, the duties of the Army and Navy subdivisions of venereal disease control seem clear, and their performance relatively easy. They include:

1. The procurement of professional personnel or, if they cannot be had from civilian life, and when conditions permit, the training of medical officers in venereal disease control, preferably through the use of established

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civilian university training centers, and the employment of such officers as clinical and public health consultants.

2. Desirable changes in administrative procedure, such as:

(a) The education of line officers and legislators toward the end of abolition of punitive measures for the acquisition of venereal disease as a necessary public health control measure.

(b) Some modification of the policy of compulsory hospitalization for uncomplicated venereal disease, or its abandonment where conditions permit; with the substitution of a system of treatment of infected personnel with their units. This change in existing procedure is calculated to decrease concealment of venereal disease, to avoid loss of manpower and to minimize expense.

(c) The synchronization of clinical and laboratory diagnostic and treatment procedures and records.

3. The supervision of educational measures for all officer and enlisted personnel.

4. The supervision of mechanical and chemical prophylaxis.

5. Cooperation with the United States Public Health Service and state and local health departments, especially in the epidemiologic approach to case finding methods in the civilian population.

6. Active support and encouragement of local law enforcement agencies in the vigorous repression of organized and clandestine prostitution in areas accessible to military and naval personnel.

7. Cooperation with the Chaplain's Corps Morale and Navy Committee on Welfare and Recreation, with the American Red Cross and with civilian welfare organizations in the provision of adequate recreational facilities for military and naval personnel both within camps and cantonments and in neighboring towns and cities.

SUMMARY

The venereal diseases in the U. S. Army and Navy are still, as they always have been, a problem of the first magnitude. Except in the event of epidemics of other acute infectious diseases, they remain, as they always have remained, the major infectious disease problem which the services face. Their importance is increased, as always, under conditions of mobilization for training or for war. The high incidence of venereal disease is of military importance because of loss of manpower, of civilian public health importance because of the additional spread of these diseases to the civilian community by infected military and naval personnel, both during and after their period of service; of individual importance because of the disabilities produced by these diseases, especially syphilis, and of importance to the taxpayer because of the cost of treatment of infected personnel and of compensation for subsequent disability.

It is believed that the control of these diseases in the Army and Navy depends in the first instance on the creation of a group of medical officers with special training in clinical and public health control measures, who devote full time to their particular task, and of the direction of these officers in the application of these measures by the newly created subdivisions of venereal disease control, now established in the offices of the respective Surgeon Generals. Given this, the job can be well done. Failing this, it will be half done. Let's get on with it!

Medical Arts Building.

If our last big army is to furnish the medical pattern for the present, an important group of chronic medical disabilities will be that referred to the heart. But that much of this disability is preventable is the conviction of thoughtful observers of medical service during the last war and during the long years of postwar hospitalizations and pension ratings. This is a time, therefore, in which it may be hoped that past experience, focused on today's work, will obviate much wastage of manpower in the armed services and of government money in the future. Much good can be done by improved standards and due care in the medical examination of selectees, and this is receiving well merited attention. This paper, however, is concerned only with the less emphasized but equally important subject of caring for men in the services.

The real problem is not that of genuine heart disease; it is that of other things which masquerade as such. Statistical studies have been made of structural diseases of the heart, based on service and later hospital records;¹ but long experience in reviewing immense individual files from these sources and then examining the results of such compilations. The fact is that many diagnoses of mitral insufficiency, myocarditis, angina pectoris and the like were mistakenly entered in the records and have been carried forward as grounds for disability ratings long after the passage of years and accumulating evidence should have removed any doubt about the original diagnostic errors. Thomas Lewis,² in reviewing the studies at Hampstead from 1914 to 1918, estimates that about five sixths of the British army diagnoses of organic heart disease were erroneous, an estimate probably not far from the truth of our own past performance. And for the practical conduct of medical service for our armed forces of the future we may safely assume that real heart disease, infrequently encountered, will usually receive adequate recognition and treatment, while other things with the superficial appearance of heart disease will require special care if we are to avoid costly mistakes of the past. These other things, the so-called functional disturbances, may be divided conveniently into those of signs and those of symptoms.

MISLEADING PHYSICAL SIGNS

Chief among the physical signs often responsible for mistaken diagnoses of cardiovascular disease are benign murmurs and arrhythmias, simple tachycardia, and temporary elevation of blood pressure from the excitement of a medical examination. Some with the last mentioned condition may be candidates for sustained hyperpiesis in later life, but they should not be regarded as abnormal without repeated observation under conditions of quiet and reassurance.

Cardiac arrhythmia in young recruits is chiefly sinus arrhythmia—alternate acceleration and retardation in heart rate, usually but not always timed with respiratory cycles. It is always benign and usually easily recognized. But at times the transitions from faster to

1. Matz, P. B.: *Am. Heart J.*, 4: 313 (Feb.), 455 (April) 1927; *New England J. Med.*, 212: 868 (May 9), 929 (May 16), 977 (May 23), 1042 (May 30), 1087 (June 6) 1935.
2. Lewis, Thomas: *The Soldier's Heart and the Effort Syndrome*, London, Shaw & Sons, Ltd., 1940.

slower rhythm and vice versa are very severe and abrupt, and create the impression of heart block. Premature contractions are also not uncommon in the young. They sometimes result from damage to the myocardium, especially those of atrial origin (usually recognizable by the fact that the pulse intermission is shorter than two normal intervals); but they are more often benign and should be so considered unless other evidence of heart disease can be found. They may produce but faint sounds, sometimes only a faint first sound, especially when occurring early in diastole; and if this is missed in auscultation, the compensatory pause may cause the mistaken diagnosis of heart block. In general no such diagnosis should be made in young soldiers without electrocardiographic confirmation.

A systolic murmur can be found in a considerable proportion of healthy young adults if they are examined in various postures, in different phases of respiration, before and after exercise. These functional murmurs are much more common during fevers. They are rather faint, but sometimes moderately loud, and are heard in the apical or pulmonic area. If not very loud, if not high pitched, if markedly changed by respiration and posture and if not accompanied by other signs of heart disease (especially enlargement of the heart), by deficient heart function or by a history of rheumatism or chorea, these systolic murmurs should not be regarded as pathologic. And in the case of borderline systolic murmurs—some of the louder ones, less clearly dependent on posture or respiration—the diagnosis of valvular disease, if suspected but not confirmed by other physical signs, should in general be held in abeyance until radiographic and electrocardiographic studies have been made.

MISLEADING SYMPTOMS

The other group, predominantly of symptoms, embraces chiefly the condition or conditions usually designated neurocirculatory asthenia, effort syndrome and the like. The main characteristic is that, without structural circulatory disease as explanation, the usual effects of tachycardia, perspiration, heart consciousness and often precordial pain—are called forth by comparatively little exercise. Pulse and breathing are accelerated except during sleep, excessively so and with delayed deceleration after light exercise. Pain is often corroborated by the finding of precordial tenderness—an observation which should be made only when the subject's attention is diverted.

After much research there remains uncertainty about the mechanism of the disturbed function involved. Similarities to hyperthyroidism are apparent. Hyperventilation and other chemical change are discussed. Minor peculiarities in electrocardiograms are reported. But despite obscurity of mechanism, certain things of great practical value in management are well known. The disturbance is of a general nature and not a reflection of real heart disease, however much symptoms referred to the heart may predominate. Constitution is the important predisposing factor and often the only obvious one. Candidates for the effort syndrome are those with poor posture, flabby muscles, poor nutrition or marked obesity; those with tachycardia, labile blood pressure, cool, moist and bluish extremities, marked dermatographia and dripping axillae; those who have avoided strenuous athletics and sought light work; often those who eschew tobacco and alcohol, perhaps after experiencing poor tolerance, and who are given to worry and to the study and adoption of diets and other health fads.

Men with such poor natural stamina may break down in ordinary military training; and then, despite the best of treatment, they are prone to continue in a state of pensioned disability, from which it is difficult or impossible ever to wean them. Others, better endowed by nature, stand vigorous training exercises but fail when adequate physical or nervous strain follows the depleting effects of infection, prolonged fatigue, insufficient food and shelter, anxiety and the like. Their disability is more often temporary because its chief causes are removable.

Often associated with the effort syndrome but also occurring without it are faintness or syncope, heightened consciousness of heart action with or without benign arrhythmia, and nonanginal precordial pain. Men of strong fiber may faint when they stand too long at attention, when they enter a medical office or rarely from pressure of the collar on the carotid sinus or from other reflex cause. Commonly there is vasodilatation and cardiac inhibition, with marked fall of blood pressure, which, however, is sufficiently mitigated in the recumbent posture. Such transitory physiologic episodes should not be confused with heart disease, hypoglycemia or other important disorder; and, if not too frequent and not associated with other evidence of unfitness, they should not be regarded as disabling.

Through introspection or suggestion it is easy for normal persons to acquire heightened perception of the ordinary beat of the heart or of the pulse in the ears or elsewhere, especially when lying on the left side—and, of course, the more so if there are ectopic beats or if the force of the heart beat is increased by too much coffee or tobacco or by simple apprehension.

And nonanginal precordial pain, a usual complaint in those with well developed effort syndrome, is not rare in others with good tolerance for exercise. It may be a diffuse dull aching or burning sensation, with or without some radiation to the arm, independent of effort or with delayed response to effort and delayed relief by rest—in contrast to the usually consistent and prompt relationships of angina. Occasionally this is due to the excessive use of tobacco. Lancing pain is only a little less common and deserves more attention. In contrast to the constricting quality and crescendo progression of the anginal seizure, it is a sudden and usually momentary sensation described as jabbing, stabbing, grabbing or like a "catch." It may be repeated at short intervals, sometimes with each heart beat, and is usually independent of effort. The subject usually avoids deep breathing, instinctively feeling that it would aggravate the pain; and he may describe the most bizarre topographic delimitations, such as a spot of pain the size of a dime above or below the left nipple, or from there a streak of pain to the left scapula, to the upper pectoral region or horizontally or diagonally across the sternum. Radiation to the left arm is frequent. Similar lancing pain is sometimes described in the right chest or in remote parts of the body. Like the common "stitch in the side," from which it differs little if at all except in intensity, its mechanism is unknown. But we do know that it is benign; and its only importance lies in the readiness with which its more severe manifestation is confused with angina—in the mind of the patient, and too often in that of the physician.

MANAGEMENT

In disability resulting from any form of masquerade heart disease, fear is nearly always an important factor and often the only one. It usually comes from suggestion. The medical officer, therefore, who finds a

murmur or arrhythmia or who hears the complaint of syncope, palpitation or precordial pain should be aware that he carries a responsibility comparable in importance to that involved in a delicate surgical operation. If he is sure of his ground, the task should be easy. If the heart is diseased he will frankly state the case and advise accordingly, being careful not to implant an exaggerated idea of the gravity of the condition. And if he is sure the sign or symptom in question does not mean heart disease, he will be equally frank and decided. In doing so, however, he should remember that words are often discounted and that attitude is more convincing. Reassuring statements may be nullified by merely calling an associate to listen to an interesting murmur or by cautioning the patient to be a little careful. If he needs to be careful to avoid aggravating an effort syndrome, the reason should be made clear by referring to general condition and the need for graded physical training, without the use of terms implicating the heart. Whether or not to mention the discovery of a benign murmur or arrhythmia is debatable. My own inclination is usually to do so, in a casual and reassuring manner—to safeguard against the possibility of a mental shock when some later examiner may be less accurate in his opinion or less careful in expressing it.

But when the medical officer doubts the significance of signs or symptoms the matter of preventing psychic harm is more difficult. Further examination will be needed, perhaps with roentgen rays and the electrocardiograph, and the soldier must know why. If his question, whether expressed or not, is met with evasiveness or with an obvious attempt at reassurance, the damage will probably be done. At all costs, therefore, the doctor should maintain an attitude of frankness. If he believes the idea of heart disease has not yet been implanted, he may give more apparent attention to other parts of the examination and then refer the man for survey of his general physical condition, while privately conveying the question of heart disease to the consultant. And the consultant, of course, should not be in a ward or on a board stigmatized with the word "heart." If, on the other hand, attention has already been fixed on the heart, the man may be referred for diagnostic study "to make perfectly sure the heart is normal"—an assumption certainly harmless and usually well justified when the examiner is in doubt.

Beyond this initial psychologic prophylaxis, similar precautions should be carried through—by the consultants for men who are referred for further study, and by the medical officers with troops for men with milder degrees of disability who are retained in their outfits or who may be assembled in convalescent camps. These camps, removed from hospital atmosphere and devoted to the reconstruction of weakened men, were inaugurated near the close of the last war. Their work was promising and should receive renewed consideration.

In cooperation with line officers, regimental surgeons can do much to minimize the incidence of the effort syndrome by attention to the many details of nourishment, rest, warmth, and adequate time for convalescence from infection, and by tempering the early physical training of recruits, while endeavoring to discover the susceptible ones and guide them into work which they can stand before serious breakdowns occur. Physical training should aim at developing in each soldier the maximum strength for which nature has designed him, while restraining him from tasks foredoomed to failure and threatening wastage of capacity.

For this purpose the gaging of fitness is essential, but auscultation of the heart and blood pressure measurements should largely give way to simple but searching observation of the general appearance and behavior of men during and after exercise. For the latter will not only cover more ground in a hurry; it is reliable and it is free from the psychologically dangerous atmosphere of doctoring. When the wouldbe athlete is ordered to lighter training by his coach, his thoughts are all in terms of physical culture, and no harm is done. But if the same man is so ordered by a doctor after a cardiovascular examination, he has a good chance of thinking in terms of pathology.

We may learn much of value from the methods and especially the manner of the athletic coach. Without stethoscope, sphygmomanometer or electrocardiograph, but with a trained eye, he has done good work. He did so before the advent of medical examinations for athletic aspirants; it would be hard to show that even then his guidance was harmful; and—let us physicians never forget—his record is not stained by the creation of masquerade heart disease.

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THE ROLE OF PSYCHIATRY IN NATIONAL DEFENSE

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The current emergency presents a great opportunity for psychiatry. Enormous preparations are under way in armies, military, industrial and civilian. Each group must be reached and helped by psychiatry to an understanding of the imperative necessity of diminishing and even relinquishing its right in order to save the democratic structure, ideologically, socially and culturally. Psychiatry as a medical science must preserve and heighten morale during the trying times of sacrifice.

The role of psychiatry in national defense can be discussed from several points of view: (1) present status of psychiatric preparedness; (2) utilization of methods of psychiatry for the peace time conscript army, the significance of morale; (3) psychiatry in industrial mobilization and civilian mental health services; (4) adequate care of psychiatric casualties during peace and war; (5) disability and compensation problems.

PRESENT STATUS OF PSYCHIATRIC PREPAREDNESS

Psychiatry is better prepared now than before the last World War to meet in a constructive manner the numerous problems of national defense. For psychiatry has developed new technics and has acquired more experience through studying the varying problems of interpersonal relationships. In order to be helpful in the present mass emergency, psychiatry needs only to enlarge its perspective and lengthen its vistas.

Psychiatrists composed the first medical specialty group that mobilized its personnel and offered its services to the armed forces of our country. This action was taken by the council of the American Psychiatric Association in May 1939 when it instructed its president to appoint a military mobilization committee to care for possible emergency developments and to confer with representatives of the Surgeon Generals of the Army, Navy and the Public Health Services. The committee,

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under the chairmanship of Dr. Harry Steckel, found that the Navy would require a minimum of one hundred and fifty experienced psychiatrists, while the Army needed at least one psychiatrist to every five thousand troops; that is, for an army of one million, two hundred psychiatrists would be required. One feels, however, that such estimates are too low if real psychiatric needs are met. It was learned at that time that comparatively few adequately trained psychiatrists could be counted among the medical personnel of either the Navy or the Army. A survey of existing trained civilian psychiatrists available for either of the services was sent to all members of the association as well as to all nonmembers who were listed by the American Medical Association as specializing in psychiatry and neurology. The satisfactory response to the questionnaire revealed that five hundred and thirty-seven members and three hundred and six nonmembers would be available for the armed forces, while four hundred and fifty-one members and two hundred and fifty-five nonmembers, because of age, physical reasons or other factors, were not available for active duty but indicated a willingness to serve on a part time basis on the home front. It would appear from this report that there is available an ample supply of trained psychiatrists for an army of four million men.

On the passage of the Selective Service Act, Steckel's committee as well as other interested groups, such as the Southern Psychiatric Association through Dr. Winfred Overholser, and the William A. White Psychiatric Foundation through Dr. Harry Stack Sullivan, its president, made contact with the Selective Service system, drawing to its attention the need for eliminating so-called psychiatric risks. Director Dykstra immediately recognized the wisdom of this important step and set up a neuropsychiatric advisory committee to work with him along these lines. Since October 1940 Dr. Sullivan has spent practically all his time at national headquarters as psychiatric adviser to the medical division of Selective Service. In a memorandum for Medical Advisory Board and Army Induction Board psychiatrists, Sullivan stated:

In the urgent interest of promoting efficient and more uniform psychiatric classification of registrants called for medical examination and with a view of preventing public misunderstanding and damage to the adaptive capabilities of registrants found psychiatrically unstable for military training, the director has authorized the holding of a series of two day seminars in various centers of population. . . . Physicians who are serving as medical examiners to local boards are not always clear about the importance of mental and personality factors in establishing suitability for induction into military service. There are those who do not realize that some of the registrants who are physically healthy should nonetheless be referred to the psychiatrist on the medical advisory board for examination. Many uninformed members of the community harbor the belief that mentally defective or disordered persons who are not doing well at home should be sent to the army to "make men of them." That this is a grievous error has been most amply demonstrated by the World War and subsequent experiences.

At the 1940 annual meeting of the American Medical Association a Committee on Medical Preparedness was organized for the purpose of preparing an index of all available medical personnel. The card index as prepared by the Steckel committee was offered to the American Medical Association committee for whatever use it might deem desirable. The National Research Council has been called on by the Surgeon General of each service for advice in the present emergency. In order to cover the neuropsychiatric aspects of the

advisory work of the National Research Council a Committee on Neuropsychiatry headed by Dr. Overholser was set up because of the many ramifications of psychiatry in the defense program. Subcommittees had been organized to undertake the different activities required of the committee as a whole. Four subcommittees have been organized, each for a specific purpose: (1) Subcommittee on Personnel and Training, (2) Subcommittee on Neurology, (3) Subcommittee on Psychiatry, (4) Subcommittee on Neuroses.

Other organizations, such as mental hygiene societies, have mobilized their resources in aiding draft boards to supply pertinent data concerning personality disorders and the previous performances of each individual. The New York State Committee for Mental Hygiene has been a leader in this noteworthy development.

It is well known that every young man who is physically able may not be emotionally equipped to stand the strain of army life, especially under war conditions. Many individuals who do quite well in a civil life in an accustomed job and familiar circumstances are prone to mental disorder under the kind of stress which army life places on unstable persons. The human and economic consequences of breakdown in the military services are tragically revealed by the results of our previous participation in war—a multitude of mental and nervous casualties which even today fill half the beds in our veterans' hospitals at tremendous cost to the taxpayers. In 1940, according to Cooley, there were 68,727 mentally disabled beneficiaries to whom the government made compensation awards of \$41,889,360 during that single year. In 1923 to 1940 the government paid out \$641,857,704 in compensation plus \$282,679,909 for hospitalization, making a total bill of \$924,537,613 for the care of mental and nervous cases during the seventeen year period. Of the ninety-one facilities provided by the government for veterans in the United States, twenty-eight are for mental cases, and of the 60,000 cases of all types of disability under hospital care 33,000 were in mental hospitals on June 30, 1940. At the present time there are plans for new construction as well as for enlargement of these existing hospitals to take care of a potential load of four million persons discharged from war time and peace time enlistments.

The recognition of nervous and mental disease, of psychopathic types of personality as well as the mentally deficient is therefore of extreme military, economic and social importance. While many physical disabilities and defects can be improved or cured during military training, the experience in the last war showed that this is not the case with mental and nervous diseases. Psychiatric work in the army must be primarily and essentially diagnostic and preventive. Its practical therapeutic usefulness consists in the recognition of impending disaster before it actually occurs.

The task of building and training a huge national army is a formidable one. Many problems are inherent in the Selective Service program, which contemplates recruiting over six million men out of a total of some seventeen million registrants. Never before, though, have we had the opportunity to examine such a large number of men. From these examinations we should be able to draw valuable information as to the health of our nation's youth.

The psychiatrist is more interested in the quality rather than the number of men, but army regulations for mobilization show more interest in throwing together a huge army for the emergency than in training a good

army. Conflict thereby exists between the two philosophies, the one of weeding out the candidate who is lacking in vocational aptitudes of the army and the other getting in all the men possible. Ideally speaking, as Sullivan puts it, "We are not sorting out nuts, queer sticks, and so on, but sorting in those fit for military life." Being emotionally unsuited for military service is no reflection on those not accepted in the draft. They should not be stigmatized any more than exclusion for physical reasons, since such persons may contribute much to the national defense in a civilian capacity. Bowman looks on the work of the psychiatrist as a process of selection according to vocational aptitude and suggests as an answer to the problem of stigma of rejection the notation "This man not accepted because he does not have the aptitude for military service."

The rejection of any large number of potential candidates to the military service of our government must raise a question as to the mental health of the nation. It is time that each community realize that within its own group there is a certain incidence of morbidity from a mental standpoint the same as there is a certain incidence of morbidity from a physical standpoint. Communities must be taught how to cope with the former problem. Not only will the psychiatrist be called on to weed out those individuals without military aptitude, but they will likewise be called on to do something for these individuals so disqualified. Work in this area is being lost sight of because of the present emergency.

No matter how thorough the physical and mental examinations are for the draftee, we cannot expect to eliminate all physical and mental risks. Certain numbers of draftees will elude the finest screening possible. It therefore becomes a responsibility on the commissioned and noncommissioned officers to aid in the prevention, early detection and proper treatment of personality disorders in the personnel of the army. In order to fulfil these aims it is essential that the company officers closely collaborate and cooperate with the medical officers in viewing and interpreting the behavior of the man and have a knowledge of a few common indications of the imminence or actual existence of possible nervous and mental disorders as they may occur in the man. One of the subcommittees of the National Research Council Committee on Neuropsychiatry has been active in the preparation of a brochure which we hope will be distributed to the line officers as well as the medical personnel service corps.

Close psychiatric supervision should continue after the draftee is mustered into the army. One of the most important psychiatric aspects will be the maintenance of good morale, which has been defined by Chisholm as "that emotional state of mind in which soldiers can most effectively perform all the military duties. It is as important as armament and equipment and without good morale an inefficient army exists." The state of good morale can be developed if both men and officers pay attention to definite psychiatric principles. The most important and difficult task is to change the soldier's attitude. A definite emotional orientation must be established, an attitude of mutual cooperation, support and confidence must replace the self-seeking, self-protective point of view which is so commonly found in our citizens.

PSYCHIATRY IN INDUSTRIAL MOBILIZATION AND CIVILIAN MENTAL HEALTH SERVICES

If the task of industrial production is to keep pace with military consumption, it is very important that the mental health of industrial workers be as competent as

that of our military services. Industrial workers, in a certain sense, must pass many of the same tests as imposed on the draftees. In the final analysis the current mobilization deals with all phases of life, and no one group can escape inspection of the psychiatrist.

In the industrial mobilization it will be important to eliminate the crank, the eccentric and the saboteur. It is likewise important that at another level the inefficient worker be examined for the sole purpose of trying to increase his efficiency through either direct psychiatric treatment or possible transfer to another department. The reasons for the absentees should be investigated and efforts made to decrease the number of days lost because of sickness.

As important as industrial mobilization is the conservation of civilian mental health. Both the Selective Service and industrial mobilization will bring to light large numbers of unstable persons who will present problems of rehabilitation. Hence it becomes highly important to maintain and improve standards of our mental hospitals, clinics and other civilian mental health services whose efficiency will be threatened by progressive induction of professional personnel into military service. These institutions must be maintained for the care of those to be rehabilitated. Of paramount importance in the present crisis is the maintenance of morale now threatened by the doubts and fears engendered by the swiftly changing developments in Europe and the hesitancy as to what America's course should be. We are exposed to sinister psychologic forces of one kind or another that are inducing deep feelings of insecurity, mental and emotional conflict and other unhealthy states of mind that militate against national unity and stop discipline and resolute and constructive action in the face of common danger. Public opinion is confused and torn between the opposing propagandas of conflicting groups. Anxiety grows with each new conquest by the totalitarians, defeatism is mistaken for realism, and a mass "blitzkrieg" neurosis threatens to paralyze the national will to action.

Enemy propaganda is producing its effects here as in other European countries. In a renewal of the psychologic experience in the present conflict Cameron notes the baleful influence of insecurity and other types of reaction in times of stress on the welfare of national groups. "States of insecurity," he says, "have been particularly prominent in the present period of warfare. The reason for this must be sought at least in part in the type of war which is being waged and in the use which is being made of psychological weapons. When there is marked insecurity, considerable falling off in production results, and the national group is often forced into attitudes of defense. These attitudes in turn lead to a lack of initiative, to a search for means of protection and escape, a secret fear of overestimation of the enemy and to defeatism rather than to a confident determination to achieve victory."

ADEQUATE CARE OF PSYCHIATRIC CASUALTIES DURING PEACE AND WAR

The first functions of psychiatric hospital facilities in United States camp areas will be for the examination and observation of recruits referred by the division psychiatrist for those who break down early during the period of mobilization and training, and later for the general mental health needs of the various commands. There should be a small psychiatric unit, approximately thirty psychiatric beds to every thousand medical beds in the base hospital. These would be only for temporary

care, since it is understood that the mentally ill are to be discharged as quickly as possible. These centers are to serve mainly as clearing centers for emergency care only. Larger psychiatric services for longer periods of treatment should be provided in connection with army general hospitals at or near the center of the larger troop concentrations. Only a few of these will be needed for purposes of mobilization and training. In the event of hostilities, more will be needed for mental patients returned home from combat areas. These small psychiatric units are being established at the present time.

DISABILITY AND COMPENSATION PROBLEMS

The problems inherent in mental disabilities and compensation problems will be lessened if the psychiatric program dealing with the induction of the draftee and his training in the service corps has been successful. By this method the mentally unfit will have been detected before acceptance for service, and those who develop mental difficulties later will have been dealt with through the general and base army hospitals, which should ideally lessen the problem of disability and compensation.

Treatment procedures should be such as to prevent serious development of incipient mental disorders and to condition the mentally ill for early return to mental health in civilian life, as against making them candidates for prolonged custodial care. The problem of discharging and caring for the mentally disabled will be greatly simplified at this time by the existence of the veterans' hospitals, which we did not have at the end of the last war, when the great majority of mental cases had to be farmed out to state hospitals under contract and at government expense until the veterans' hospitals were built. The hospitals operated by the Public Health Service were few and grossly inadequate to meet the large case loads of returned soldiers.

The veterans' facilities will have to be enlarged, since at the present time provisions are based on the expectations of over four million persons discharged from military services in connection with previous wars. It is obvious that another new army of six million or more men will create new demands, which the Veterans' Administration is planning to meet. Because of the strain placed on Veterans' Administration facilities it behooves us, first, to "exclude to the hilt" potential psychiatric risks from military service and, second, to make provisions for treatment in the army hospitals that will eventually clear up as many cases as possible—especially the neurotic conditions in their maladjustment by war service—and discourage invalidism and compensation neurosis.

I cannot discuss all the implications of the compensation problem but should like to comment on one special phase of the problem. Campbell has pointed out that compensation in psychoneurotic disorders is a more difficult problem than compensation in other disorders, for psychiatric symptoms represent one aspect of the behavior of the individual, behavior determined not only by conscious purposes and ideas but also by unconscious motivations. The behavior of an individual can seldom be attributed to a single factor but has to be understood in the setting of a complex system of forces. It is a little dangerous to pick out one factor such as the influence of compensation and to discuss it in isolation from the other factors involved. It is well to keep in mind the fact that in peace time and in cases in which there is no question of monetary compensation, cases

of psychoneurosis may be refractory to treatment and may persist for years. There are other gains from the psychoneurosis than a monetary gain.

It is obvious that there are difficulties in relation to the attempted solution of the problem of compensation in the psychoneurotic by means of lump sum payment. As a matter of fact there is probably no solution for the problem of the psychoneurotic veteran, but there is great need for efficient prevention and treatment through the wider dissemination of knowledge of the significance of these disorders throughout the forces and throughout the community at large, and through the recognition by the medical profession of the principles involved in the treatment of the psychoneurotic whether they are civilians or veterans.

There is a likelihood that the government will continue to be as liberal in its rewards to disabled ex-soldiers with the new army as before. It is therefore highly important that those without military aptitude in the present draft be eliminated rather than accepted for military service. It is possible that the burden of compensation for "service connected disabilities" resulting from a new war may become so great as to cause a reaction away from the generous provisions by the government in the past.

Examination of literature on preparedness¹ indicates the general acceptance of the following recommendations for prevention and treatment of personality disorders in the military service.

(a) Every examining board physician and individual officer should have knowledge of personality disorders and be encouraged to use this knowledge.

(b) All recruits and selectees should be drafted for a period of probational training of three to six months in order that the misfits, neurotic, psychopathic and psychotic can be eliminated.

(c) Selective Service Administration should develop a department to form a liaison between school and community agencies and other services so that educational, social and health records of the recruits and selectees can be made more easily available in evaluating the men before induction.

(d) Armed services should, as far as it is feasible and possible, avail themselves of the experiences and technics of industry in choosing personnel.

(e) There should be one psychiatrist or physician with some psychiatric knowledge on each county draft board—at least on each of the larger county draft boards.

(f) The public should be instructed in mental health through a wider propagation of fact than now prevails.

(g) Existing agencies should be made use of or new ones established to advise and assist rejectees in making better civilian adjustments and in obtaining medical and psychiatric treatment.

(h) Rehabilitation and vocational guidance services should be set up to reestablish disabled and discharged service men in society in a useful way.

(i) Such terms as "shell shock," disordered action of the heart, neurocirculatory asthenia and all others that implicate a part of the body diseased when it is only participating in a personality reaction should be eliminated from medical and psychiatric terminology.

1. Articles include:

- Cameron, D. Ewen: Psychiatric Problems of the Civilian Population During Mobilization and Warfare, unpublished material.
Campbell, Charles Macfie: Memorandum on Compensation for Psychoneurotic Disorders, unpublished material.
Chisholm, G. Brock: Good Morale—A Military Necessity, Addressed to Officers of the Canadian Army, unpublished material.
Cooley, Martin: The Economic Consequences of Inadequate Psychiatric Examinations, read at the ninety-seventh annual meeting of the American Psychiatric Association, Richmond, Va., May 4, 1941.
Steckel, Harry A.: The Organization of Psychiatry for the Emergency, read at the ninety-seventh annual meeting of the American Psychiatric Association, Richmond, Va., May 4, 1941.
Billings, Edward G.: The Literature on Military Psychiatry Since 1938. *Am. J. M. Sc.* 201: 905-918 (June) 1941.

(j) In the combat army the psychotic individual should be immediately evacuated and sent to the appropriate hospital for intensive treatment. The psychoneurotic patient should receive intensive therapy in the zone of combat and returned to duty as soon as possible.

(k) Psychiatrists should be stationed at the battalion collecting station in the zone of combat.

(l) More or less permanent organizations should be developed to formulate means of improving case records, to evaluate the clinical and other data, to direct research and to integrate those data with new medicopsychiatric movements and projects that are of particular importance to military and civil mental health and to industrial and vocational psychiatry.

The present situation affords one of the few opportunities in our history to study and advance the cause for good mental health. We are called on to inspect the mental health of a large block of the male population of the nation. I have indicated that if the principles of psychiatry are properly utilized the military, industrial and civilian population will profit immeasurably. Morale must be maintained through the belief that every one has an important role to play in the defense of this country. Essential in the maintenance of morale is the necessity to check closely the sources of our information in order to protect ourselves from unfavorable propaganda.

There is need to study the causes of war and the nature of the people who make these wars necessary. Perhaps the same psychiatric principle should be utilized in the selection of military, diplomatic and political leaders as are necessary in the selection of the draftee.

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THE PROBLEM OF TUBERCULOSIS IN MILITARY SERVICE

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Active tuberculosis disqualifies for acceptance in military service. According to the standards¹ in effect in recent years physical examination to exclude tuberculosis is required of applicants for enlistment, and chest roentgenograms are obligatory in the case of every candidate for commission in the Regular Army and for extended active duty as a Reserve or National Guard officer. Roentgenologic evidence of reinfection (adult) type tuberculosis, active or inactive, or of primary (childhood) type tuberculosis of such degree as to suggest the likelihood of future clinical significance excludes a candidate from acceptance for appointment as an officer in the Regular Army and for assignment to extended active duty as a Reserve or National Guard Officer.

In the United States Navy likewise tuberculosis disqualifies for acceptance for military service. Roentgenograms are made routinely in the course of physical examination.

Nevertheless a certain amount of active tuberculosis is discovered each year in the personnel of the Army. Most of this is believed to represent disease that escaped detection at the time of examination for admission. Some may be the result of breakdown of lesions of originally supposed trivial character. The Report²

of the Surgeon General of the Army for 1940, covering the experience of 1939, records a general hospital admission rate for the entire army of 1.8 cases per thousand men for tuberculosis and a rate of 1.0 for officers.

THE COST OF UNDIAGNOSED TUBERCULOSIS

Selective Service, introduced in the fall of 1940, made clear the necessity for a revised system of physical examination in many respects, including tuberculosis. The experience of the World War showed the grave deficiency of reliance solely on physical diagnosis for the exclusion of tuberculosis in rapid mass induction. The heavy economic burden placed on the people of the United States for insurance, compensation and medical care of tuberculous veterans of the World War was analyzed in *THE JOURNAL* last year by Spillman,³ who attributed the great cost to the omission of roentgen ray examination from the preinduction examination.

The records of the Veterans Administration⁴ show that, in 1921, 25,603 World War veterans with tuberculosis were admitted to hospitals under the jurisdiction of the administration. In 1940, 9,039 World War veterans were admitted. The total number of tuberculous veterans hospitalized in veterans' hospitals varied from a peak of 44,591 in 1922 to a low figure of 13,615 in 1934 and the somewhat higher figure of 16,411 in 1940. The annual cost of hospitalization varied from a maximum of \$29,751,114 in 1922 to \$9,552,647 in 1940. The total cost for the twenty years from 1921 to 1940 inclusive was \$348,701,662. The figures are for veterans of all wars, but the Veterans Administration estimated that 95 per cent of the cost was for World War veterans. Finally, in 1940, 54,855 World War Veterans judged to have service connected tuberculosis were on the rolls of the Veterans Administration receiving compensation or pensions, which in that year were estimated to amount to \$35,490,848. Spillman,³ from a study of annual federal reports, estimated that up to October 1940 tuberculosis in veterans of the World War had cost approximately \$960,000,000 in compensation, vocational training, insurance and hospitalization.

In analyzing such costs it must be recognized that not all of the expense would have been saved had tuberculosis been completely excluded from the Army. Many of the soldiers found to have tuberculosis would have been treated at public expense in the course of time in municipal, county or state institutions, at a cost comparable to that in the federally operated hospitals. However, exclusion would have reduced the heavy costs for insurance and compensation in the thousands of cases in which tuberculosis in the absence of preinduction detection was adjudged "service connected."

That a great saving might have been effected is recognized throughout the country. The fact has been emphasized repeatedly in meetings sponsored by various medical and lay groups, and the subject has been given publicity in the lay press.⁵ It is now universally agreed that roentgenologic examination is far more effective in detecting early tuberculosis than physical examination, and recognized that preinduction examination of all recruits by roentgenography will avoid ultimate heavy federal costs for tuberculosis.

The principles concerned seem established in other countries, in some of which data have been placed on record. In the mobilization in Canada in the present

From the Henry Phipps Institute, University of Pennsylvania.
1. Standards of Physical Examination for Entrance into the Regular Army, National Guard and Organized Reserves, A R 40-105, War Department, Washington, D. C., Aug. 17, 1940.
2. Annual Report of the Surgeon General of the U. S. Army, 1940, Washington, United States Government Printing Office, 1941.

3. Spillman, Ramsay: The Value of Radiography in Detecting Tuberculosis in Recruits, *J. A. M. A.*, 115: 1371 (Oct. 19) 1940.
4. Figures from the Budget Officer of the Veterans Administration, through the courtesy of Dr. Martin J. Cooley.
5. Waring, T. H.: Editorial, *Time*, April 14, 1940.

war, preinduction roentgen ray examination was made routine in November 1939. Jones⁶ stated that the tuberculosis cost in Canada after the last war was \$150,000,000. On the expectation of great saving from the elimination from the Army of 1 to 2 per cent of all men called for military service, through roentgenologic detection of tuberculosis, chest films were made mandatory for all men called in the present mobilization. Standard 14 by 17 inch celluloid films were employed, with the aid of radiologists in hospitals or private offices throughout Canada. The rate of rejection for tuberculosis was reported as 1.06 per cent.

In mobilization in Australia the fluorophotographic method with 35 mm. film has been used extensively.⁷ The rate of rejection for tuberculosis was reported as 0.5 per cent. Even with this low rate it is believed a substantial saving is effected.

SELECTIVE SERVICE EXAMINATIONS IN THE UNITED STATES

It was officially recognized by the Surgeon General of the Army in 1940 that roentgen ray examination of all recruits was desirable. In Mobilization Regulations⁸ issued Aug. 31, 1940 tuberculosis of the lungs was made a disqualifying defect except for arrested disease of minimal extent, that extent being carefully defined on a roentgenologic basis. In such cases an opinion of the examining physician was required on the possibility of reactivation under conditions of military service. However, the roentgenologic standard could not be applied routinely, since roentgenograms frequently were not made both because of lack of equipment in many of the induction centers and because of other administrative details in the individual corps areas over which the Surgeon General did not have control. Thus tuberculosis of the lungs was declared a disqualifying defect, with the exception noted in the preceding paragraph, but the chest examination in many instances was made by the methods of physical diagnosis only. The regulations read "The chest examinations will include the usual methods of physical diagnosis supplemented, whenever indicated, by radiographic and laboratory studies." There was no lack of appreciation by the Surgeon General's Office and line officers that the phrase "whenever indicated" should be interpreted liberally. An order⁹ issued by the Adjutant General on Oct. 25, 1940 directed the commanding generals of all corps areas and departments to make chest roentgen ray examination on every registrant with evidence suggesting pulmonary disease and in addition routinely on all registrants as far as local roentgenologic facilities would permit, through arrangements made with state and civilian roentgenologic laboratories, methods of compensation being carefully outlined.

The surgeons of the first, second and third corps areas took full advantage of the directive order. In these areas almost every prospective recruit reaching the induction center had a chest roentgen ray examination. In the other areas the coverage was much less, varying from about 80 per cent in the seventh corps area to almost complete omission of roentgen ray examination of inductees in other corps areas. Figures given by Col. C. C. Hillman¹⁰ of the Office of the Surgeon

General of the Army indicate that approximately 51 per cent of men called to induction centers up to March 1, 1941 received roentgen ray examination.

In April 1941 new roentgen ray equipment was received in approximately half of the induction centers in operation. In the next few months it is apparent that much more equipment will be made available, so that shortly chest roentgen ray examination will be made of all candidates for induction.

However, it is impossible to discount the fact that about half of the men inducted in the first six months of Selective Service did not have chest roentgen ray examinations. Presumably in this group are many men with minimal or even more advanced tuberculosis undetectable or at least undetected by the methods of physical examination used, who will be discovered later to be tuberculous and become the beneficiaries of the federal government for supposedly service connected disease.

ROENTGENOLOGIC METHODS AVAILABLE

A major difficulty will be overcome when roentgen ray equipment is installed in all induction centers. However, the equipment will not be uniform and some variation in results from different stations may be expected on this score. A subcommittee on tuberculosis, one of several committees set up in the Division of Medical Sciences of the National Research Council to advise the medical officers of the military services (see Larkey¹¹ for list of committees), considered the following acceptable for chest roentgen ray examination for tuberculosis: single standard size (14 by 17 inch) celluloid films, single standard size paper "films," 4 by 5 inch fluorograms and 35 mm. fluorograms.

Much attention has been given by radiologists and tuberculosis specialists to the relative merits of the different types of chest roentgen ray examination, and varying conclusions have been reached, based on speed, cost and reliability. An unprejudiced review of the literature indicates that no other method yet devised results in a product equal in reliability to standard sized celluloid films prepared with proper technic. The latter are definitely superior to 4 by 5 inch fluorograms, and these in turn surpass 35 mm. fluorograms in the detection of small tuberculous lesions, even when the latter have the advantage of stereoscopic examination. Deduction from published reports indicates that paper films and 4 by 5 inch fluorograms are of about equal merit in the detection of minimal tuberculous lesions.

Approximately half of the induction centers at the present time are equipped to make 4 by 5 inch fluorograms. However, in view of the admitted superiority of 14 by 17 inch celluloid chest films taken by standard roentgenography and the probability of frequent referral for standard technic after fluorography or other methods, there is reason to believe that increased reliance will be placed on full sized celluloid films in the future. The opinion has been expressed frequently that the additional cost above that for the rapid methods using small film or paper is small in comparison with the saving effected.

PERSONNEL FOR EXAMINATION

A problem greater than that of equipment is interpretation of the roentgenograms secured. Results now available show a wide variation in the amount of exclusion for tuberculosis at the different induction stations, a variation greatly exceeding that to be expected from differences in known tuberculosis morbidity in different

6. Jones, W. A.: Routine Chest Examination of Recruits, Canada. *M. A. J.* 43: 213 (Sept.) 1940.

7. Cooper, E. L.: Pulmonary Tuberculosis in Recruits: Experiences in a Survey by the Microradiographic Method, *Brit. M. J.* 2: 245 (Aug. 24) 1940.

8. Standards of Physical Examination During Mobilization, MR 1-9, War Department, Washington, D. C., Aug. 31, 1940.

9. Chest X-Rays on Induction Examination, Adjutant General to Commanding Officers of All Corps Areas and Departments, Oct. 25, 1940.

10. Hillman, C. C.: Personal communication to the author.

11. Larkey, S. V.: The National Research Council and Medical Preparedness, *War Medicine* 1: 77 (Jan.) 1940.

geographic regions. The conclusion is inescapable that the interpretation of films and bases for rejection are not the same at different induction centers. The chief reasons for variation seem to be personal differences among radiologists in reading films and variance in interpretation of standards for rejection. Two remedies should be applied. The first of these is selection, for the interpretation of chest roentgenograms, of physicians highly competent in the radiologic diagnosis of tuberculosis. The great cost from undetected tuberculosis makes this requirement necessary. The subcommittee on tuberculosis in the National Research Council, to which reference has been made, has recommended not only that roentgen ray examination be made of all candidates for admission in the army but that each induction board include in its personnel an expert in the diagnosis and care of tuberculosis, and that in the course of the preinduction examinations this physician be required to view all chest roentgenograms taken.

Much progress has been made in cooperative efforts between the American Medical Association, the National Research Council and the Surgeon Generals of the Army and Navy in evaluating the competence of physicians who have designated special interest in tuberculosis. (See Leland¹² for a review of actions by the American Medical Association and Larkey¹¹ for the activities of the Division of Medical Sciences of the National Research Council.) Evaluation lists, permitting the most advantageous selection of personnel, are being made available to the Surgeon Generals of the military services.

STANDARDS FOR REJECTION

The other remedy for the present lack of uniformity in rejection for tuberculosis is improvement in the phrasing of standards for acceptance and rejection. The experience of the first six months of Selective Service showed that the greatest problems in the exclusion of men on the basis of chest roentgen ray examination lie in the determination of the significance and stability of small scars found in the lung fields on roentgenologic examination, and of the calcified masses found in the lung fields and at the lung roots. It appears desirable to define the limits of acceptance closely on an anatomic basis and to make certain that the objective determination of the character and extent of lesions is considered in the light of good clinical judgment. It is believed that small strandlike fibroid lesions should not exclude a prospective recruit from acceptance, provided acceptance is deferred until subsequent examinations show the scar to be perfectly stable. Furthermore, small isolated calcified residues of lesions characteristic of primary infection of the lungs and tracheobronchial nodes should not be cause for rejection provided they appear in the roentgenogram as dense, isolated, sharply circumscribed masses and are not numerous. Long experience has shown that such lesions are reactivated rarely if ever. It is expected that new standards defining the limits objectively will be adopted.

RATE OF REJECTION FOR TUBERCULOSIS

Because of the variability of returns from the different areas and the amount of selection of cases for roentgenography in these areas, a simple summation of returns to date would not give a valid picture of the amount of tuberculosis being discovered. It will be better to refer to figures from areas of complete roent-

genologic coverage of men coming up for induction, where the personnel employed is known to be thoroughly competent and where the average tuberculosis rate is approximately that of the United States as a whole. A recent paper by Plunkett¹³ on examinations in upstate New York, giving figures for Buffalo, Syracuse and Albany, provides information probably affording an index for determining the amount of tuberculosis to be found in the general course of preinduction examination. In the examinations reported for these cities 0.9 per cent of candidates for induction were rejected for military service because of roentgen ray evidence of tuberculosis. Different methods of roentgen ray examination were used in the induction centers in these three cities, with slightly differing results. The average cost of the roentgen ray examination in the period covered by the report was 54 cents per man. The average per capita cost for cases of tuberculosis discovered was \$63.

A slightly higher figure of rejection has held in New York City, where the rate of disqualification for tuberculosis, according to Edwards,¹⁴ has been approximately 1.3 per cent. In the men rejected for significant tuberculosis the disease discovered was minimal in 50 per cent, moderately advanced in 43 per cent and far advanced in 7 per cent.

In Pennsylvania similar figures have been recorded. According to Reynolds¹⁵ about 0.5 per cent of men called were rejected on evidence of tuberculosis by the local draft boards, and 1.46 per cent were rejected at the induction centers. Thus in this state the total rate of rejection for tuberculosis is about 2 per cent.

THE GOAL TO BE ACHIEVED

Experience during and after the World War indicates that preinduction roentgen ray examination is necessary if great costs for the compensation and care of tuberculous veterans are to be avoided, and recent experience in both the Army and the Navy shows that universal preinduction examination is practical and feasible. With the means available it appears easily possible to induct an army without any clinically significant tuberculosis. Roentgenologic examination of enlisted and inducted men who escaped such examination on admission should be made as soon as possible to free the Army from its present unrecognized clinically significant cases and thereby prevent spread from healthy to well persons within the army. Finally, periodic reexamination by roentgenology is essential to discover new cases resulting from outside exposure. Admittedly all of this is costly in money and soldiers' time, but past experience indicates that such expenditures will be justified in the ultimate great saving effected. In addition to the saving effected for public funds in the avoidance of heavy costs due to tuberculosis, a great benefit will ensue for the men concerned and the country in the early detection of many cases that might otherwise progress to an advanced state. Early discovery should insure prompt arrest in the majority of such cases. Thus universal preinduction chest roentgenography in the examinations for Selective Service and voluntary enlistment in the Army and the Navy can be an effective measure in promoting personal and public health in addition to its immediate value for military purposes.

Seventh and Lombard streets.

12. Leland, R. G.: A Census of Physicians for Military Preparedness, War Medicine 1:95 (Jan.) 1941.

13. Plunkett, R. E.: Tuberculosis Among Selective Service Men in New York State, War Medicine, to be published.

14. Edwards, H. R.: Personal communication to the author.

15. Reynolds, C. R.: Personal communication to the author.

SYMPOSIUM ON POLIOMYELITIS

The six articles which follow comprise a panel discussion on poliomyelitis which was read at the annual session of the American Medical Association in Cleveland, June 3, 1941. The discussion was sponsored by the National Foundation for Infantile Paralysis and the American Medical Association.

ETIOLOGY OF POLIOMYELITIS

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Poliomyelitis is an acute infectious disease that is caused by a filtrable virus with sufficiently distinct properties to permit its identification with as much certainty as is possible for any of the well known bacteria. A virus can be identified by its size, by its host range (i. e. the species of animals which it can or cannot infect), by its tissue affinities and therefore the type of disease it engenders, by the changes it produces in infected cells and by its immunologic properties. With regard to the etiologic agent of poliomyelitis it is known that it is one of the smallest filtrable viruses, its size having been estimated at approximately ten millionths of a millimeter (10 microns). Thus it can pass through the finest filters and membranes, which retain not only the bacteria but most other viruses as well. It can be sedimented only by prolonged centrifugation on powerful ultracentrifuges, and it is known that the individual virus particle is large enough to accommodate only a few molecules of the size of hemoglobin. The virus has been purified to a considerable degree both by adsorption and elution with alumina gels and by differential ultracentrifugation. The material obtained by both methods of purification contained only 5 to 10 millionths of a milligram of nitrogen per infectious dose of virus. While the virus is resistant to phenol and ether, it is most readily destroyed by oxidizing agents such as hydrogen peroxide and potassium permanganate, by ultraviolet rays and by heating at temperatures of 55 C. or higher for as short a time as five minutes. Recent experiments have brought out the possibility that the amount of chlorination adequate for killing enteric bacteria in water may not suffice to destroy the virus of poliomyelitis.

Of all the viruses known to attack the human nervous system, the virus of poliomyelitis has the most limited host range. The virus, as contained in human tissues or excreta, has thus far been found to be pathogenic only for certain monkeys and chimpanzees but not for mice, guinea pigs or rabbits. Armstrong's recent adaptation of a strain of poliomyelitis virus to cotton rats and mice has not thus far been reproduced with any other of a large number of recently isolated or monkey passaged strains of the virus. Other more recent reports of adaptations to rats, mice and guinea pigs have not yet presented sufficient evidence to permit any definite conclusion. Whether or not Armstrong's cotton rat and mouse adapted virus is actually a human poliomyelitis virus, the fact that it is neutralized by approximately 70 per cent of human serums and certain monkey convalescent serums suggests a close immunologic relationship to most strains of poliomyelitis virus. Since it is now known that mice can spontaneously carry a

virus in their intestinal tract which on occasion invades their nervous system to produce a poliomyelitis-like disease, and since this mouse virus has the same size and tissue affinities and is also pathogenic for cotton rats although not for monkeys, the possibility is now being considered that there may perhaps be a whole family of poliomyelitis viruses in nature which vary not only in their natural habitat but also in their experimental host range, and some of them may be immunologically related to a certain degree. The analogy for this concept is found in the herpes simplex, B. virus and pseudorabies family of viruses—all of which are of the same size, have similar tissue affinities, produce similar inclusion bodies, possess a certain immunologic relationship but reside in different hosts (herpes simplex in man, B. virus in monkeys, pseudorabies in pigs and cattle) and vary in their experimental host range.

Poliomyelitis virus possesses highly specialized tissue affinities. Numerous studies on monkeys and human beings have thus far failed to bring forth any evidence to suggest that the poliomyelitis virus can multiply in cells other than the neurons of susceptible hosts. This strict neuronotropism and definite tissue specificity of poliomyelitis virus is reflected not only in its limited adult host range but also in its inability to multiply in the undifferentiated embryonic chick or mouse tissues in which so many other viruses have been cultivated. The only unequivocal, successful multiplication of the virus in vitro has been found by Olitsky and me to take place in the brain and cord of young human embryos, while no growth occurred in cultures containing the lungs, kidneys, liver and spleen of the same embryos. Confirmatory evidence of its growth in cultures containing human embryonic nervous tissue was obtained in Burnet's laboratory in Australia.

Before proceeding to a consideration of the behavior of the virus in monkeys and in human beings it may be worth while to call attention to the fact that many immunologically distinct types have been demonstrated which are so sharply defined that the serum of monkeys convalescent from one type will not protect against another, and also that the convalescent monkeys which are immune to reinoculation with the homologous type can be reinfected with a heterologous type. It is of some interest, therefore, that approximately 70 per cent of human adult serums have been found to neutralize not only standard monkey passage virus but also Armstrong's mouse adapted Lansing strain. However, competent investigators have recently questioned anew the hypothesis that the antipoliomyelitis antibodies in human serums are the result of infection with the virus, and no definite conclusions are possible until further investigations have been carried out. Despite many efforts, it has not been possible to demonstrate specific immunologic reactivity by means of precipitin tests, complement fixation tests or cutaneous tests, and the aid which these tests can render in the specific diagnosis of many other infectious diseases is not available in poliomyelitis.

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The work of the past few years has indicated that the invasiveness and behavior of the poliomyelitis virus may vary in different species of monkeys, as well as in chimpanzees and human beings. The ease with which the experimental disease is produced in rhesus monkeys by direct injection of the virus into the central nervous system, the large nerve trunks or the vitreous of the eye is of little consequence in a consideration of possible natural routes of infection. It is also well established that experimental poliomyelitis can be produced with varying degrees of frequency in rhesus monkeys by injecting the virus into the peritoneal cavity, the tonsillopharyngeal region, intracutaneously, subcutaneously, intravenously or into the intestine. That all these peripheral sites do not offer the virus equally good opportunities for invasion of the nervous system was demonstrated in a study which revealed the special susceptibility of the tonsillopharyngeal region. It was found that amounts of virus which were regularly innocuous when given intracutaneously or subcutaneously produced the disease, which incidentally was predominantly bulbar in type, in 80 per cent of rhesus monkeys when injected into the tonsillopharyngeal region. It was furthermore shown that under those circumstances the virus invaded the central nervous system along the nerves supplying the tonsillopharyngeal region rather than along the olfactory pathway. This greater capacity of virus localized in the tonsillopharyngeal region to invade the nervous system may account for the relatively large number of cases of bulbar poliomyelitis which have been reported in the past ten years as occurring within a short time after tonsillectomies and adenoidectomies performed at a time when poliomyelitis was prevalent in the communities.

Without any trauma, however, and by transitory contact alone, experimental poliomyelitis develops most regularly in rhesus monkeys when the virus is instilled intranasally and the olfactory pathway is available for its progression into the nervous system. On the other hand, it is equally well established that rhesus monkeys can swallow or receive by stomach tube large amounts of virus, which pass through the alimentary tract in active form, without ever contracting poliomyelitis. It is this fact, probably more than any other, that has been responsible for the consideration of the nasal route, and more specifically the olfactory pathway, as the most probable natural portal of entry of the virus in man. A number of events in recent years, however, has led many investigators to question the validity of this concept and to reexamine some of the foundations on which it rested. Among these events was the apparent lack of success in human beings of the chemoprophylactic procedures which so readily protected monkeys against infection by the nasal route and the absence in human olfactory bulbs of the lesions found to be reliable indicators of the olfactory portal of entry in monkeys.

In the years preceding these events there were some scattered reports that in cynomolgus monkeys, as contrasted with the rhesus, it was possible to produce poliomyelitis by feeding the virus. It was never clear in these experiments, however, that infection had not occurred by way of the olfactory pathway as a result of contamination of the nasal mucosa. More recently Burnet, Jackson and Robertson reported the production of poliomyelitis in cynomolgus monkeys by swabbing the virus on the throat or tongue and by feeding under conditions which presumably excluded the olfactory pathway. More striking evidence that infection through

the alimentary tract without involving of the olfactory pathway is possible in still another host was supplied in the past year by Howe and Bodian, who showed that chimpanzees whose olfactory tracts had been severed contracted poliomyelitis after being fed virus contained in human stools.

Our knowledge of the behavior of the virus in human beings was so meager, however, that it was not possible to construct any picture of the natural history of the disease. It was known, for example, (1) that in the human disease the virus was demonstrable in the central nervous system, although its distribution therein was unknown; (2) that it had been isolated on a number of occasions from the tonsils, although it was not clear whether the virus was in the tonsils or in the attached pharyngeal tissue; (3) that on one occasion it was presumably isolated from the nasal mucosa, and (4) that on a number of occasions it had been demonstrated in nasopharyngeal washings, although it was never clear whether the virus in such washings originated from the nose or from the pharynx. The fact has finally been firmly established in the past few years that the virus is present in the intestinal contents, although again the source of the virus in those contents was unknown, and the commonest explanation since the first reports of Kling, Petersson and Wernstedt has been that it has its origin in the swallowed secretions of the upper respiratory tract. Some controversy existed about the occasional demonstration of virus in certain lymph nodes, but it has been generally agreed that it is not present in the blood, the spinal fluid or the viscera.

In a study of human poliomyelitis which I carried out in association with Dr. Robert Ward during the past year the distribution of virus throughout the body was mapped. Twenty-two different specimens taken in each case were tested for virus. The tissues tested were selected for their capacity to indicate (a) whether or not a certain system was affected, (b) what might be the centrifugal or centripetal pathways pursued by the virus outside the central nervous system and (c) whether at the time of death the virus is distributed indiscriminately throughout the central nervous system or is present in appreciable amounts in some areas and not in others in accord with a definite pattern. In brief, the results indicated (a) that in human beings the virus is distributed predominantly in only two systems—the nervous system and the alimentary tract, (b) that it does not spread centrifugally from the central nervous system to affect peripheral tissues containing collections of nerve cells of the sympathetic or parasympathetic systems and (c) that even at death the virus is not distributed indiscriminately in the central nervous system but rather that it is confined to certain regions in good agreement not only with the known distribution of neuronal lesions but also with a progression of virus along specific pathways and insulated tracts. Thus in the central nervous system, the olfactory bulbs, the anterior perforated substance with the adjacent corpus striatum and the anterior frontal and occipital portions of the neopallial cortex were consistently negative, while the motor cortex, the diencephalon, the mesencephalon, the medulla and pons and the spinal cord were predominantly positive. In the alimentary tract the virus was found in the pharyngeal tissue, whether or not the tonsils were present, in the washed wall of the ileum as well as in the contents, and only once in the washed wall of the descending colon, while its contents regularly contained the virus. On the other

hand, tests for virus in the nasal mucosa, the salivary glands, the superior cervical sympathetic ganglions, the adrenals and the cervical and mesenteric lymph nodes were consistently negative. In view of this indication that the centrifugal spread of virus, which is so common in rabies, does not occur in human poliomyelitis, it is considered significant as a possible index of one centripetal pathway that the virus was found in at least 1 instance in the abdominal sympathetic (celiac) ganglions. The pattern of virus distribution in human poliomyelitis, as it emerges from this study, points to almost the entire alimentary tract as the primary site of attack by the virus and contains no support for the concepts involving the olfactory pathway, the respiratory tract or the cutaneous route, although it is conceivable that occasional infection by direct contamination of the broken skin may be possible. Because of the total absence of evidence indicative of generalized dissemination or secondary centrifugal spread of the virus, the involvement of the walls of the alimentary tract can, in the light of our present knowledge, be interpreted only that that is where the virus enters the body and multiplies outside the central nervous system. A simultaneous study on the elimination of virus in human poliomyelitis revealed that when comparable methods were used the nasal secretions, oral secretions and urine were not infective, while the stools were positive in about 40 per cent of the paralytic cases. It was observed incidentally that in children under 8 years of age the virus could be demonstrated in 64 per cent of the group, which was four times as frequent as in the older age groups.

Having surveyed all these observations one might inquire as to just how the course of events in human poliomyelitis may be visualized on the basis of present knowledge. It seems to me that one may be permitted to visualize the virus entering the human body by way of the mouth and establishing itself throughout the alimentary tract, where it proceeds to multiply. While further work is necessary to indicate to what extent various levels of the alimentary tract are affected, there is already more than suggestive evidence that the walls of the pharynx and small intestine are among the chief sites of virus multiplication, and the feces the chief means of virus elimination. Whether the virus multiplies in the nerve cells, which are contained in the walls of the alimentary tract, or in the non-nervous tissues remains unknown. However, whatever the type of cells affected in the alimentary tract, the virus may be visualized as beginning its invasion of the central nervous system essentially along two pathways: one leading into the medulla by way of the cranial nerves that supply the upper part of the tract or by way of the parasympathetic system along the vagus from the lower part, and the other leading into the spinal cord either along the visceral afferent fibers through the spinal ganglions or along the visceral efferent fibers from the intestine by way of the abdominal sympathetic ganglions. If the greater attack and spread of the virus is along the first pathway one may expect a syndrome in which bulbar signs are primary, while if the second pathway is more predominantly affected the primary paralysis would be in the extremities. That these pathways may perhaps be used simultaneously, the outcome depending on the route by which the virus arrives in the central nervous system first, is suggested by the fact that in a purely bulbar case the virus has been found in the pharynx, ileum, colon and abdominal sympathetic ganglions.

The inapparent or abortive type of case would be either one in which virus multiplication is limited to the alimentary tract or one in which the virus also invades the central nervous system but fails to destroy a sufficient number of nerve cells to give rise to clinical signs. This view is based in part on the recent finding in monkeys inoculated with human virus that an equilibrium may be reached between the host and the virus before sufficient neurons have been destroyed to interfere with apparently normal function. Similarly, in the nonparalytic type of poliomyelitis the virus may be visualized as multiplying in the alimentary tract and invading the central nervous system, but the activity of the virus within the nervous system is suppressed before a sufficient number of neurons to give rise to paralysis has been destroyed. That the virus may continue to multiply in the alimentary tract long after the disappearance of clinical signs of disease is evident from the fact that in some instances the virus has been found to be excreted in the stools for weeks and months after clinical recovery; one instance is recorded in which a patient with abortive poliomyelitis is still excreting the virus four months after a mild illness of two days' duration.

Finally, I should like to stress that the picture of human poliomyelitis which I have just drawn represents only a working hypothesis suggested by existing data, and it must be realized that as new knowledge is accumulated it will be either modified and extended or completely abandoned.

DIAGNOSIS OF POLIOMYELITIS

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To diagnose poliomyelitis it is necessary to know the types of poliomyelitis that have been described. These are noted in table 1.

Rarely is the clinical disease solely abortive, peripheral, meningeal, cortical, facial or hemiplegic. Usually the patient has a combination of types with spinal or bulbar involvement. Thus, a patient may have a bulbospinal or spinal condition with one or more of the following: meningeal irritation, some form of peripheral nerve irritation, a facial involvement, hemiplegic involvement and, in rare instances, a cortical reaction. Uncomplicated disease of the spinal cord is not fatal unless there is Landry's type of spread of the disease or the infection spreads to and involves the cervical area. Incidentally, the mortality rate is highest in the group of cases of bulbar and bulbospinal poliomyelitis.

Poliomyelitis is a disease of the lower motor neurons. In the fully developed case, the deep reflexes are decreased or absent; the pathologic reflexes are absent; loss of function, atrophy of muscles and a reaction to degeneration are found.

The normal deep reflex responses are not always absent. If the disease process spreads slowly, they may be overactive at first but tire with repeated stimuli. The physician should not be satisfied merely to demonstrate hyperactivity; he should continue to test the reflex response to determine whether or not hyperactivity persists or whether hypoactivity or loss of response will follow repeated stimulation. The reflexes on one side as compared to those on the other may be

decreased, or they may be absent entirely, as when paralysis is definitely present. If the patient is paralyzed and reflexes still persist, the diagnosis of poliomyelitis should be questioned.

The superficial abdominal reflexes disappear very early in this disease. One should not confuse these with the deep abdominal reflexes. In most cases, the former diminish or disappear in the early stages of

TABLE 1.—Types of Poliomyelitis

Type	Paralysis	Mortality	Incidence
I Abortive	Absent	None	Said to be common in epidemics
II Peripheral neuritis	Absent	None	Rarely seen
III Meningeal	Absent	None	Rarely present alone
IV Spinal	Present	About 3%	Most common type (75-90%)
V Bulbar	Present	High (75-100%)	Next most common type (10-25%)
VI Facial	Present	Low when sole involvement	Not infrequent
VII Hemiplegia	Present	Low	Infrequent; rarely seen save during large epidemics
VIII Cortical	Absent	None	Rarely seen save during large epidemics

the disease, as they do in typhoid, another gastrointestinal disease.

In testing for the superficial responses, one should flicker a piece of cotton only lightly over the abdomen. The deep abdominal reflexes are usually present; these can be elicited by pressing the abdomen deeply with an applicator. One can continue pressing and proceed downward over the inside of the thigh and thus obtain the cremasteric reflex. These and the deep reflexes of the abdominal wall are reflexes of a spinal arc type.

It should be remembered that the presence of paresis is just as much evidence of a reacting nervous condition as is the presence of paralysis. In the latter condition, however, the lost function is more obvious. Muscles should be tested against resistance and in their natural arcs, e. g. the foot muscles in walking, standing on the toes, standing on one foot and walking upstairs.

The reflex changes in the order of their frequency occur as follows: loss of superficial abdominal reflexes, diminished or absent deep reflexes, knee, ankle, biceps and triceps reflexes and so on.

A superimposed meningeal reaction may be present as well, with a stiff neck, a positive Kernig sign, a positive Brudzinski sign, pain in the neck, pain along the spine and opisthotonos.

When signs of a lower motor neuron lesion and a meningeal irritation are present, the chances are that the diagnosis is poliomyelitis.

If there is a cortical involvement, and this is rare, all or some of the signs of an upper motor neuron response may be present, such as hyperactive reflexes, spasticity, incoordination, pathologic reflexes (Babinski, Oppenheim and the like) and clonus. Function is not lost and atrophy and reaction to degeneration are absent. These signs may be present after the period of shock is over.

Poliomyelitis is a segmental disease. Legs and arms are late embryologic acquisitions. As they bud out from the embryo they take with them their nerve supply. These nerves do not run like the segmental nerves to the rib muscles; they become bunched, crowded and arranged in a plexus. Thus, fibers from several seg-

ments run from the cord to several muscles in the periphery, often in one large nerve. If a segment in the cord is involved, then only the muscles supplied by the nerves from that area will become affected, despite the fact that the nerve to the periphery might carry many other nerve fibers from many other segments (fig. 1).

A long nerve in the arm or leg should be examined. If the leg is involved, the sciatic nerve should be studied. This nerve supplies practically all muscles on the back of the thigh and all those below the knee. If the patient can wiggle the toes but is unable to move the gastrocnemius muscle group, the lesion is probably central in origin and hence segmental in type.

In multiple neuropathy, all the reaches of a nerve are involved irrespective of segmental origin. All branches of the nerve peripheral to the point of irritation will be involved and all signs distal to this will be those of a lower motor neuron lesion. In a patient who has paralysis which has started in the tips of the toes or fingers, a peripheral disease should be suspected.

In poliomyelitis there must be not only a lower motor neuron disease but this disease must be segmental in character.

Clinically, the signs that appear are stiff neck, pain along the spine, head drop, a positive Kernig sign and occasionally a positive Brudzinski sign. The stiffness of the neck, when present, is not similar to that seen in meningitis. It is more voluntary, a mobilization of the neck muscles which can be overcome by a slight, steady resistance, unlike that in true meningitis.

Pain is often described. Such pain is not in the skin, which is never hyperesthetic. The pain is in the muscle. It is present when the muscle is activated and can be elicited by pressure over the muscles and especially at the points at which the tendons insert themselves into the bones. This pain is not commonly present, but when found it may be severe, and the patient will object to being handled and will adopt a froglike position in bed. Usually, these painful muscle groups are the ones that subsequently become paralyzed.

Often, long before the somatic muscles in the arms and legs are involved the urinary bladder and the gastrointestinal tract have become paralyzed. Fre-

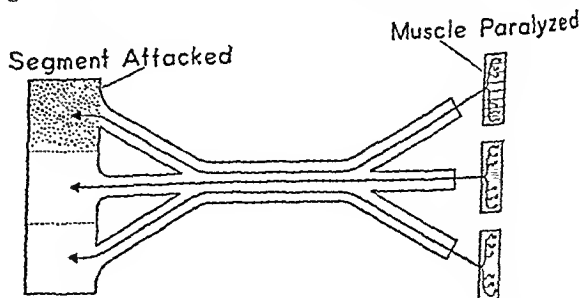


Fig. 1.—Schematic drawing to illustrate segmental paralysis.

quently, this is unnoticed in children because of bed wetting. The bladder should always be carefully examined because quite often these patients have paralysis of the bladder with retention and overflow dribbling.

The paralysis of the intestine is obvious, even to the parents, who often relate that the patient could not move his bowels for several days prior to the time that he became paralyzed.

There is a preparalytic and a paralytic stage of poliomyelitis. There are no differences in symptoms, however, save that there may be no paralysis for from two to four days after the symptoms and general signs appear; or there may be a quiescent period between the usual original symptoms and signs and the paralytic stage; or, as is often the case, the spread of the disease

TABLE 2.—*Differential Signs and Symptoms*

Type	Signs and Symptoms Plus Positive Spinal Fluid Findings
I Abortive and preparalytic	Any one or more of the following: headache, fever 2-5 days lasting 4 days or more, stiff neck, pain along the spine, nausea, vomiting, gastrointestinal signs, diarrhea, constipation, pain and cramps, restlessness, sore throat (not common)
II Peripherical neuritis	Typical symptoms of peripheral neuritis over the skin, chiefly paresthesias (not to be confused with segmental pain of central origin occurring in muscles)
III Meningeal	All symptoms of type I, abortive and preparalytic, plus meningeal signs (mentioned in text), positive Kernig, etc.
IV Spinal	All signs of type I, abortive and preparalytic, and perhaps type III, meningeal; occasional convulsion, delirium, plus segmental pain in the muscles and tendons (not skin hyperesthesia), sweating, irritability, signs of a lower motor neuron lesion, athetoid movements, froglike position in bed; if areas from the second, third and fourth cervical segments are involved, there will be signs of difficult breathing, and suffocation may follow; there may be difficulty in urination and in defecation
V Bulbar	All signs of type I, abortive and preparalytic, perhaps type III, meningeal, plus signs of gag reflex, fast, mucous, somnolence, perhaps paralysis of muscles supplied by the ninth, tenth, eleventh and twelfth nerves, less often the seventh and infrequently the third and sixth nerves—the latter usually in the matter of accommodation; individual cranial nerve palsies may occur
VI Facial	All signs of type I, abortive and preparalytic, and occasionally type III, meningeal (typical Bell's palsy findings)
VII Hemiplegic	All signs of type I, abortive and preparalytic, and possibly type III, meningeal, and signs of an upper motor neuron on one side (see text)
VIII Cortical	All signs of type I, abortive and preparalytic, possibly type III, meningeal, plus signs of general encephalitis, i. e., an upper motor neuron lesion

may be so rapid that signs, symptoms and paralysis are synchronous.

The disease cannot be definitely diagnosed unless the spinal fluid presents typical abnormalities. There may be a slight increase in pressure. The color is clear, although occasionally it has a faintly ground-glass appearance. There is an increase in the number of cells, from 25 to 1,000, the average being 100. Most cases are not diagnosed until paralysis appears, at which time the cells found are lymphocytes. In epidemics in which cases may be diagnosed early, even before the paralysis appears, the cells may be predominantly of the polymorphonuclear type, but the leukocytes are usually replaced by lymphocytes within twenty-four to forty-eight hours. The Pandy test is usually positive, from 1 to 4 plus. The sugar and chloride contents are ordinarily normal. Occasionally, the spinal fluid will show a spurious positive Wassermann reaction.

There is no distinctive laboratory test. The spinal fluid itself has rarely been proved to be infectious. If the patient dies, the virus may be isolated from the spinal cord. Even this procedure is difficult and frequently unsuccessful. If the patient recovers, there is no way whereby the diagnosis may be established scientifically, unless neutralizing antibodies can be demonstrated and unless the virus can be found in the nasal washings or gastrointestinal contents. This is not practical for the practitioner.

The symptoms that may occur with the various types of the disease are listed in table 2.

Though I have given the various signs and symptoms, one has to tax one's memory to remember the many uncorrelated details. It is better to consider these from a knowledge of the portal of entry and pathogenesis of the disease. They then become more obvious and clear-cut. For twenty years I have taught that the gastrointestinal tract is the portal of entry in this disease and have pointed out that the spread of the virus would have to be over the sympathetic and parasympathetic nervous systems to the lumbar, cervical and medullary areas in the cord and medulla, with isolated spreads occasionally occurring along cranial nerves (fig. 2). With this in mind, table 3 has been prepared.

The most important evidence in differential diagnosis is obtained from an examination of the spinal fluid. If this is purulent and yellowish, the diagnosis is not poliomyelitis. If there are a great number of leukocytes present and the patient is paralyzed, the diagnosis is usually not poliomyelitis. It might be equine encephalomyelitis. The only time that there is an increased polymorphonuclear leukocyte count in poliomyelitis is during the early stages of the disease, prior to the time when paralysis is present. The practitioner usually does not see cases at this stage. If the cells are predominantly leukocytes, the probabilities are that bacteria cause the condition, and they can be identified on a

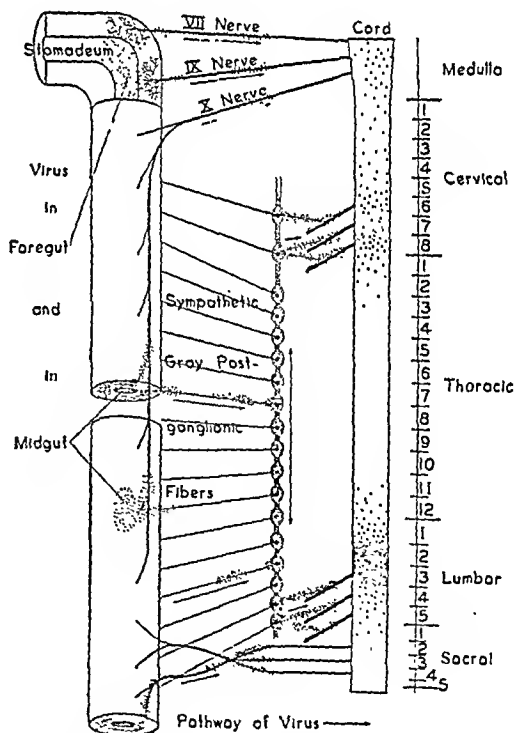


Fig. 2.—Schematic drawing to illustrate spread of poliomyelitis from the gastrointestinal tract. Dots represent the possible position of the virus. Absorption would be along the sympathetic and parasympathetic nervous systems to the lumbar, cervical and medullary areas. Isolated spreads could be along some cranial nerves as indicated. The arrows indicate the possible path of spread.

stained smear. There are two exceptions to this dictum—i. e., when a sterile abscess is approaching the surface, and in cases of early epidemic meningitis, when leukocytes but no organism may be found.

If the type of cell present is mixed and the proportion of lymphocytes is greater than that of leukocytes, the patient is either recovering from an acute infection which might have been pyogenic in origin, commonly an irritation of the meninges, or some disease is developing which ordinarily causes a lymphocytic reaction. A second puncture to determine the further progress of the disease is indicated. If the ratio becomes more lymphocytic, one knows that one is probably dealing with a disease causing a lymphocytic reaction. If the cells are predominantly lymphocytes, it is known that the disease is an encephalitis of some character—it may

TABLE 3.—Possible Method of Spread of Virus in Infantile Paralysis

Phase	Position of Virus	Symptoms
I	At first the virus is free in the gastrointestinal tract	There are none; or possibly some with diarrhea and pain
II	The virus becomes fixed in the unmyelinated postganglionic fibers of the thoracolumbar outflow and parasympathetic nervous system and spreads along the sympathetic nerve fibers to the ganglia	The abdominal reflexes are absent or modified; there may be constipation, indefinite pain in the belly and pain over the back
III	The virus spreads from the sympathetic nervous system and reaches the somatic segmental nerve	In addition to the symptoms described in phase II, there is hyperactivity of the reflexes with tiring on repeated stimulation
IV	The virus, spreading backward over the somatic segmental nerve, reaches the spinal ganglia	In addition to the symptoms described in phases II and III, there is segmental pain in the muscles and tendons supplied by nerves of the segments involved
V	Simultaneously, the virus is absorbed and excreted; enough may accumulate at one time in the urinary bladder to involve the detrusor and sphincter muscles	A peripheral type of urinary bladder paralysis with overflow dribbling may now appear when the virus factors present are possibly absorbed by the terminal gray nerve fibers of the bladder and its neck, whether of the sympathetic or of the parasympathetic nervous system
VI	The virus reaches the cord and involves the anterior horn cell	In addition to the symptoms described previously, the reflex reactions now become diminished or lost; muscle paresis or paralysis appears
VII	The virus travels up the sympathetic nerve chain to involve the cervical area	Here the train of events is the same as outlined in phases III and VI
VIII	The virus may be virulent enough to be absorbed directly by the vagus nerve (i. e., the connector fibers in the gastrointestinal tract)	A condition simulating bulbar palsy appears; there is dysphagia, dysarthria, etc.
IX	The virus may be absorbed directly over the chorda tympani, from the pharynx, etc., directly to the nucleus of origin of the cranial nerve in the bulb	The results are the same as in phase VIII
X	In the rare instance, the virus may travel along the gray nerve fibers of the autonomic nervous system to the bulb, the internal capsular and the cortical areas	The symptoms here would depend on the localization of the virus, with bulbar palsy, and hemiplegia and encephalitic reactions

be tuberculous, idiopathic, Japanese, syphilitic or the like—or poliomyelitis. In brief, the presence of lymphocytes places the disease among the chronic types of meningeal irritations or among the encephalitides (table 4).

Organisms may be demonstrated in cases of tuberculous encephalitis and virus in those of the St. Louis, Japanese, equine encephalomyelitis and lymphocytic choriomeningitis types.

The amount of protein is of interest. It gives a clue as to the severity of the involvement. In lymphocytic choriomeningitis there is frequently a lack of or a small amount of protein, although a great number of cells may be present. On the other hand, when few or no cells are present and there is a definite protein increase, one should suspect multiple neuropathy.

The sugar in the spinal fluid is definitely decreased in tuberculous. The serologic reaction is positive in syphilis.

In the differential diagnosis it is important to know the type of neuron lesion, whether lower or upper. The presence of an upper motor neuron lesion practically always rules out poliomyelitis (save in cortical types). The presence of a bizarre type of neurologic response with a combination of lower and upper motor neuron signs practically always identifies tuberculous meningitis. Bizarre neurologic signs are not found in infantile paralysis. A patient with fleeting signs—present one day, absent the next and present the day following—does not have poliomyelitis.

In differential diagnosis, therefore, one must exclude various encephalitides, meningitides, multiple neuropathies, the pseudoparalysis of scurvy and rickets, rheumatic fever and accidents (broken bones).

Equine encephalomyelitis usually attacks children of either sex, has an acute onset, a rapid progression, a mortality of 70 plus per cent and is found where epizootic diseases occur in animals. The spinal fluid is clear to ground-glass in appearance and contains from 200 to 2,000 cells, mostly polymorphonuclear leukocytes; the globulin is 4 plus.

Epidemic encephalitis strikes at patients in the third or fourth decade; it occurs any time with signs and symptoms of an upper motor neuron lesion. This, together with a history of diplopia and a tic, makes a presumptive diagnosis.

St. Louis encephalitis attacks at any age during the summer in the vicinity of St. Louis. The signs are those of an upper motor neuron disease. There are none of a lower motor neuron lesion. There is no involvement of the eye muscles. The disease is transmissible to animals.

In postvaccinal encephalitis, there is encephalitic irritability followed by stupor, a history of vaccination, a relatively low lymphocyte count with an extremely high protein content in the spinal fluid. If the patient is seen at the onset, there are signs of an upper, but not of a lower, motor neuron lesion. Later, during coma, neurologic reactions may be absent.

In lymphocytic choriomeningitis (acute benign idiopathic meningitis, acute aseptic meningitis, benign aseptic choriomeningitis, epidemic meningitis serosa, serous meningitis), the onset is acute and the progress rapid, and it occurs in any age group at any time and in any locality. It is accompanied by headache, muscular pains and sometimes constipation. Neither muscle weaknesses nor neurologic signs are present, except perhaps a positive Kernig sign and a stiff neck. The spinal fluid shows the following: normal sugar and chloride, negative reactions to all tests, a meningitic gold curve, a cell count ranging in number from 20 to over 1,000 cells, 90 per cent of which are lymphocytes, with little or no protein. Clinically, it is impossible at times to separate this entity from the abortive type of poliomyelitis, especially when it occurs during an epidemic of poliomyelitis. However, the virus is easily adapted to rats or mice, and neutralizing antibodies are readily found in the blood serums of patients convalescing from the disease.

Syphilitic meningitis, usually seen in adults, is ruled out by history, positive blood serologic reaction of the spinal fluid, i. e. positive Kline and Wassermann reactions, a parietic curve and the like.

Tuberculous meningitis, found usually in the young of either sex and during any season of the year, is

difficult to exclude, especially if the patient is seen early. There is a history of exposure. The patient with this disease is ill for days with but few symptoms and little or no fever. He progresses to the final stage of somnolence in which there is a rapid progression of the signs and symptoms with bizarre neurologic reactions and involvements of the eye muscles (the chameleon-like eye) and finally death. There is a drop in the sugar content of the spinal fluid.

In cases of influenza there may be a stiff neck, and the gastrointestinal symptoms may be the same as those seen in cases of early poliomyelitis. However, the neurologic and spinal fluid findings are negative.

Multiple neuropathy can be diagnosed by the history and by the presence of combined sensory and motor paralyses; sometimes there is a dissociation of the pain and temperature sense and other signs of a peripheral neuritis. The spinal fluid contains protein. In about 50 per cent of the cases the spinal fluid contains up to 50 cells, all lymphocytes. Poliomyelitis patients may have some edema of the cord, which in itself may cause paralytic symptoms. Edema disappears within two weeks after the onset. If the patient still has massive paralysis after a month has elapsed it is evident that there has been a massive destruction of anterior horn cells. Anterior horn cells do not regenerate;

TABLE 4.—*Type of Cell in Spinal Fluid and Disease Condition*

Leukocytes	Lymphocytes
Pyogenic infections	Encephalitis—Japanese, St. Louis, idiopathic and so on
Equine encephalomyelitis	
Serum disease and so on	Recovered serum disease
Very early poliomyelitis *	Menigitis—tuberculous, syphilitic
Very early tuberculous meningitis	Recovered cases of pyogenic meningitis, poliomyelitis, lymphocytic chorionmeningitis

* Rarely seen in practice.

therefore, I may offer as a dictum that "any one who has had massive paralysis for a few weeks and who then completely recovers did not have poliomyelitis." He probably had multiple neuropathy. Most of the so-called cases of winter poliomyelitis that have appeared in our locality have been such.

Occasionally, patients are seen in the hospital with herpes zoster, a tumor, acute multiple sclerosis and uremia who may have as many as 50 cells, all lymphocytes, in the spinal fluid; but the physical examination and history will rule out poliomyelitis.

The diagnosis of rickets is usually obvious. There are craniotabes, pot belly, delayed dentition, enlarged wrists and ankles, beaded ribs and the like.

The patient with rheumatic fever may not be able to move his legs because of pain; the immobilization, however, is voluntary. There is an increased sedimentation rate, pain at the insertion of the tendons or in the joints, multiple joint involvement, perhaps a cardiac murmur and a good therapeutic response to salicylic acid.

In children a broken leg or arm must be considered. It is a common thing to have children with fractures diagnosed as having poliomyelitis, and vice versa. Here again movement is painful and hence there is immobilization of the legs. Careful examination shows that all muscles are used, although they are tender. The spinal fluid is normal. Roentgenograms confirm the diagnosis.

When scurvy occurs, there is pain usually along the shafts of the bones, bleeding from the gums, a history of

not eating fruits and vegetables containing the anti-scorbutic factor, a positive roentgen examination and a normal spinal fluid.

During the summer, the physician should be on guard for patients who start to have difficulty in speaking, difficulty in clearly enunciating syllables, sounds, words and especially consonants or who have any difficulty in swallowing solid foods or liquids. Such persons should be considered as having poliomyelitis until proved otherwise.

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THE PATHOLOGY OF POLIOMYELITIS

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Because of the nature of the disease, the early lesions of acute poliomyelitis or infantile paralysis in man are accessible for study only at necropsy, and it is from such material that the cytopathologic picture has been built. Although the chordal and bulbar lesions afford the chief sources for clinical expressions of the disease in the form of palsies, the damaging effects of the infection in the central nervous system are more widespread. Focal areas of injury are present in most if not all cases in the pons, brain stem, motor cortex and meninges, so that a more descriptive terminology would appropriately designate the pathologic-anatomic aspects of the nervous involvement as meningo-encephalomyelitis. Evidences of injury have been found likewise in the dorsal root ganglion, and a more complete search would probably disclose lesions rather constantly in these structures and perhaps likewise in peripheral ganglions. Some investigators have attached perhaps too great a significance, at least from the standpoint of pathogenesis, to the extraneural manifestations of irritation and hyperplasia in mesenteric and enteric lymphatic tissue which are especially conspicuous in children.

In the spinal cord the lesions are most prominent and extensive in the cervical and lumbar enlargements, especially in gray matter of the anterior horns.

It is the destruction of ganglion cells in these areas that has dominated the dramatic clinical expression of the disease, notably flaccid paralysis of the extremities, although epidemiologists now believe that nonparalytic infections with the poliomyelitic virus can be recognized during outbreaks in families and in communities.

Pathologically the disease is associated with destructive lesions in the gray matter of the spinal cord and brain, the white tracts being largely spared. More intimately, much discussion and investigation have centered about the problem of the initial site of injury—that is, whether the lesion is essentially an interstitial or a parenchymal myelitis.

The foundation for this controversy was laid by Charcot, who maintained that the original injury involved first the motor ganglion cells in the anterior horns of the spinal cord. The opposing point of view interpreted the degeneration and necrosis of the ganglion cells to be secondary and dependent on injury and inflammatory reaction of the vascular stroma.

It was evident that fundamental problems hinged on the solution of this question and detailed studies of the human and experimental disease have focused on it and

have added from time to time increments of knowledge that have led to present day concepts and conjectures of pathogenesis.

Rissler gave the first detailed study of the acute stages of the human lesions in 1888, and subsequent observers have not added much to his general picture of chromatolysis, lysis, coagulative necrosis, inflammation and neuronophagia particularly of the anterior horn ganglion cells, although interpretations have varied and some specific details have been supplied. Wickman, for example, maintained the opinion, as did many of the earlier pathologists, that degeneration of the ganglion cells resulted from primary interstitial reaction even though it was only edema. Forssner and Sjövall attributed to the neuronophages considerable importance in the degeneration of nerve cells, in which process the polymorphonuclear leukocytes and polyblasts seemed to manifest the chief if not the sole activity, while Wickman considered the latter to be the only active agents, because the leukocytes died rapidly. Wickman recognized, nevertheless, as did Strauss, a type of degeneration which seemed to be an autolysis with absorption without phagocytosis, just as Rissler had depicted it sometime before.

Investigation of later years has placed again in the foreground the nerve cell changes, and, as the observation of Forssner and Sjövall has indicated, the view has become prevalent that the majority of ganglion cells are disposed of by means of phagocytosis only as a consequence of their primary and essential injury, which constitutes a *sine qua non* for neuronophagia.

The point of view of primary injury to the nerve cells is not inconsistent with the clinical manifestations of poliomyelitis, although it does not exclude participation of inflammation as an accessory factor, because it does not explain as well, perhaps, the improvement in the extent of paralysis which follows subsidence of the acute stage of the disease as would a possible removal of mechanical forces or chemical agents supplied by the inflammatory state.

It is not surprising that the inflammatory phenomena in the lesions of poliomyelitis in contrast to neuronal damage attracted so much attention for a while and acquired so great a significance in early studies of the disease, because they usually dominate the microscopic scene. Confined almost exclusively to the gray matter of the cord, but appearing likewise about blood vessels and in the meninges, the inflammation manifests itself even grossly by the protruding, swollen appearance of the anterior horns in transverse sections of the cord proclaiming the edema, while the pink color and the red flecks indicate the congestion of blood vessels, and even rarely petechial foci. Under the microscope congestion is evident, and the infiltration, especially of the anterior horns, of innumerable cells foreign to this tissue demands attention primarily to the extent that an appreciation of the loss of many ganglion cells and the degeneration of others as already described necessitates closer scrutiny. As a rule, extravasation of blood is absent or not a conspicuous feature. Thus the early surmise that the sudden stroke of paralysis might be explained by vascular rupture has not been sustained, nor do emboli or thrombi occur to substantiate the assumption of a vascular basis for pathogenesis. Edema, congestion and the outpouring or multiplication of infiltrating cells might still be accessory mechanical factors contributing to dysfunction of the nerve cells or, through the formation of chemical substances, be responsible to some extent for injury to the nerve cells.

In early interpretations of the lesions those who held the hypothesis of primary damage to nerve cells thought that the infectious agent or its toxin acted directly on these structures and that, many of them having been destroyed, the resulting products induced inflammation. Others maintained that the infectious agent acted primarily on the interstitial tissues causing congestion, hemorrhage and exudation. As a result of the vascular disturbances and the inflammatory reaction nerve cells were damaged or destroyed secondarily.

The investigations of the experimental disease in monkeys published in 1929 by Fairbrother and Hurst threw a new light on the whole subject of the pathology and the presentation of evidence that the virus infects neurons and spreads along axis cylinders from one focus to another. These observations have been confirmed most recently and most conclusively by the work of Bodian and Howe; there is accumulating considerable evidence that the nervous lesions of the human disease can best be explained on the assumption that the virus is neurocytotropic.

Bodian and Howe have postulated two primary pathways for the spread of the infection through the central nervous system, each determined by axonal fibers and groups of nerve cells. They based their view on experiments on monkeys, but preliminary study of human lesions seem to confirm it.

The idea that poliomyelitis is essentially an infection of the central nervous system has not been acceptable to all students of the disease. Some have held with Draper, Peabody and Dochez that there is a general (that is, extraneural) infection involving particularly the lymphatic tissues, and Burrows frankly championed the view that the disease is primarily one of the lymphatic system and that the central nervous system is only rarely and accidentally involved. This view, however, has little support from experimental or human material with respect either to the character and distribution of lesions or to the demonstrable location of virus.

The presence of meningitis in association with poliomyelitis has exerted an important influence on concepts of pathogenesis. Thus Flexner and his associates, basing their conclusions on infected monkeys, maintained that the virus reaches the central nervous system in the human infection by way of perineural lymphatics of the nasal mucosa penetrating the cribriform plate to reach and to infect the leptomeninx. Proliferation of virus in this membrane resulted, they thought, in spread of the infection along perivascular channels into the parenchyma of the central nervous system.

There is no doubt that in the monkey virus can enter the central nervous system through the olfactory mucosa, but there is much sound evidence that it penetrates the olfactory bulbs and spreads through the nervous substance directly by way of axis-cylinders and other nerve cell processes. There is no acceptable evidence that the virus can enter the central nervous system except through neural channels. However, the exact site or sites of entrance in the human disease is not yet known.

One theory is that, as appears to be the case in suitable experiments on monkeys, the virus infects through the nerve fibers of the nasal mucosa and is excreted through the nose along similar channels. The absence of significant lesions in the olfactory bulbs and lobes in the human disease and failure to demonstrate virus in these structures has cast considerable doubt on the nasal route of infection.

In the last few years there has been a renewal of interest in the possibility of infection by way of the gastrointestinal tract. This has been due to the repeated demonstration of poliomyelitic virus in feces and in sewage from infected foci, often in extremely high concentration. There is no doubt now that large quantities of the virus can be eliminated in this way. Convincing evidence that the portal of entry is through the gastrointestinal tract is, however, yet lacking. Some recent experiments indicate that infection can take place more readily through the oral and pharyngeal surfaces than through the intestine (for example, experiments of Howe and Bodian with the chimpanzee). Sabin and Ward found no evidence that the lymphatic tissues of the mesentery harbored the virus in the patients examined by them, but they found it present significantly in the wall of the small intestine.

There is no evidence at hand that the virus of poliomyelitis can infect extraneural tissues, and for the present at least it would seem wise not to neglect the possibility of a neural portal while all other possibilities are being explored. Lesions have been found in posterior root ganglions, and a thorough canvas of the sympathetic and autonomic system both for lesion and for the presence of virus should be made in the quest for the portal of entry and the mechanism of infection of the central nervous system.

SERUM THERAPY AND VACCINATION

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SAN FRANCISCO

SERUM THERAPY

Although the adverse results of experimental and clinical study have caused the abandonment of convalescent serum therapy in poliomyelitis in many places, it is still customary to use it in many others, partly because belief in its efficacy persists and partly because no other treatment with any resemblance to specificity is available. In communities in which its use is customary, it is hard for the physician skeptical of its value to withhold it; if he should do so and the end result is paralysis or death, he may be blamed for the outcome. Since the treatment is ordinarily harmless, he is therefore apt to give it anyway. The situation is unfortunate. It is not the medical ideal to use treatment which is useless. One should weigh carefully the available evidence, both experimental and clinical, to find whether serum actually does benefit the patient and, if so, one should use it. If it does not it should be withheld and the patient or his family spared from false hopes, disappointment and heavy expense.

So far as it is not entirely empirical, serum therapy is based on the specific neutralizing antibody which is found in the serum of many persons who have recovered from poliomyelitis, as well as of the majority of adults without any history of the disease,¹ and which can be artificially induced in animals and in human beings who have received injections of virus. A mixture of such serums with active virus in proper proportions and under suitable conditions will not infect animals. Virus is not, however, destroyed in the process. The action of the neutralizing substance has

been shown by Sabin² to be not on the virus but on the body cells, which may be protected if the serum reaches them first but not if virus reaches them first. This implies that serum may have a protective effect but not a curative one. The protective effect might conceivably occur even after infection is already present in the body by limiting its extension to areas not yet infected. Broadly speaking, this would appear to be most effective in virus diseases in which, as in measles, after a period of local infection the virus invades the blood stream and becomes generalized; under these circumstances serum given before invasion of the blood stream could protect to some extent.³ More and more evidence has accumulated, however, that poliomyelitis is not a blood-borne infection and that, as the experiments of Bodian and Howe⁴ show, it is not merely neurotropic in the usual sense of the word—that is, specific for the tissues of the central nervous system in general—but is actually neuronotropic—that is, limited in its capacity to multiply to the neurons themselves. It can no longer be maintained that the infection in its so-called preparalytic stage is invading the meninges from without; it is already implanted in the neurons of the central nervous system when the first symptoms show themselves. Microscopic examination shows this clearly, and the fact that changes in the spinal fluid are so often present at the onset is clinical proof. In theory, a possibility of blocking the passage of virus from one neuron to the next by the early use of serum has been suggested⁵ but is not supported by the experiments of Schultz and Gebhardt. In two very thorough studies they⁶ have shown that an extremely potent serum (in the sense of a high virucidal content) given daily in large amounts beginning twenty-four hours after intranasal inoculation was completely incapable of preventing the development or of modifying the course of the experimental disease. These experiments have been criticized as not applicable to human poliomyelitis because of the greater severity of the disease in the rhesus monkey, but certainly the objection is more than offset by the fact that the monkeys received a much more potent serum, given in large amounts more often and much earlier than is ever done in the case of human beings. It is also known that the presence of neutralizing antibodies in human beings does not prevent the occurrence of the disease, including paralysis, for there are at least 3 instances in which they have been detected in the blood of patients during the preparalytic period.⁷ Several workers⁸ have come to

2. Sabin, A. B.: The Mechanism of Immunity to Filtrable Viruses: II. Fate of the Virus in a System Consisting of Susceptible Tissue, Immune Serum and Virus, and the Role of the Tissue in the Mechanism of Immunity, *Brit. J. Exper. Path.* **16**: 84 (Feb.) 1935.

3. Rivers, T. M.: *Lane Medical Lectures: Viruses and Virus Diseases*, Stanford University, Calif., Stanford University Press, 1939, p. 109.

4. Bodian, David, and Howe, H. A.: Neurotropism and the Genesis of Cerebral Lesions in Poliomyelitis: An Experimental Study, *Bull. Johns Hopkins Hosp.* **68**: 58 (Jan.) 1941.

5. Faber, H. K.: Acute Poliomyelitis as a Primary Disease of the Central Nervous System: A Reconsideration of the Pathology, Symptomatology and Treatment, Based on the Hypothesis of Axonal Propagation of the Infective Agent, *Medicine* **12**: 83-186 (May) 1933.

6. Schultz, E. W., and Gebhardt, L. P.: Observations on the Prophylactic Value of Specific Immune Serum in Experimental Poliomyelitis, *J. Pediat.* **7**: 332 (Sept.) 1935; Observations on the Therapeutic Value of Specific Immune Serum in Experimental Poliomyelitis, *ibid.* **6**: 615 (May) 1935.

7. Harmon, P. H., and Harkins, H. N.: The Significance of Neutralizing Substances in Resistance and Recovery from Poliomyelitis, *J. A. M. A.* **107**: 552 (Aug. 22) 1936. Brodie, Maurice; Fischer, A. E., and Stillerman, Maxwell: Neutralization Tests in Poliomyelitis: Sera Taken During the Acute and Convalescent Stages of the Disease and Tested with a Passage Virus and a Strain Isolated During the 1935 New York City Outbreak, *J. Clin. Investigation* **16**: 447 (May) 1937.

8. Burnet, F. M., and Jackson, A. V.: Poliomyelitis: 2. The Significance of Neutralizing Antibodies in Human Sera, *Australian J. Exper. Biol. & Med. Sc.* **17**: 261 (Sept.) 1939. Hudson, N. P.; Lenette, E. H., and Gordon, F. B.: Factors of Resistance in Experimental Poliomyelitis with Comments on Immunity in Poliomyelitis, *J. A. M. A.* **106**: 2037 (June 13) 1936. Schultz.⁹

From the Department of Pediatrics, Stanford University School of Medicine.

1. Schaeffer, Morris, and Mueckenfuss, R. S.: Experimental Poliomyelitis, New York, The National Foundation for Infantile Paralysis, 1940, p. 30.

SERUM THERAPY—FABER

JOUR. A. M. A.
JULY 26, 1941

the conclusion that there is no discoverable relationship in poliomyelitis between actual resistance to infection and the neutralizing antibody, which Schultz⁹ regards as "merely an adventitious by-product of infection."

Analysis of the clinical data on serum therapy is complex, difficult and easily misleading, especially so in reports in which there are no untreated controls. A few conspicuous examples of the latter, selected for their high percentages of recovery, are shown in table 1, all patients treated during the preparalytic stage.

At first glance these results, particularly those of Jensen,¹⁰ are very impressive, but serious objection must be raised to accepting them at face value. First of all, the exclusion of patients already paralyzed greatly raised the expectancy of recovery in the remainder over the general rate, regardless of treatment. In at least one study in which serum treatment was not given,¹¹ was 86 per cent, and that in 1917 when mild, non-paralytic attacks were somewhat more likely to be missed than later on. The recovery rate for a group in the preparalytic stage (that is, patients in whom paralysis does not develop very early or before the diagnosis is made) is about three times as great as that for patients with initial paralysis and appears to average about 80 per cent.

Second, the day of hospitalization after the onset seems to have a decisive effect on the outcome, since it is to be taken as the time after the onset when the patient is put to bed and to rest. Jensen's data read in this light illustrate the point; here the percentages of recovery were good only for the first two days but after that were actually worse, despite serum treatment, than for the epidemic as a whole.

Third, mistaken diagnosis has at times to be considered. There is no absolute criterion for the diagnosis of poliomyelitis other than recovery of the virus itself; nonparalytic poliomyelitis is always a presumptive

on the basis of the mildness of the attacks, the low death rate and the occurrence of many atypical cases whether a concurrent epidemic of another disease might have been present.

Fourth, the proportion of nonparalytic attacks sometimes increases sharply in the later stages of an epidemic, as in that reported by Riggins¹³ (in which serum was very little used), thus raising the natural chances of recovery at a time when serum, if employed, would

TABLE 2.—Preparalytic Cases: Outcome in Relation to Treatment

Treatment	Number of Cases	No Residual Paralysis		Deaths	
		Number	Per Cent	Number	Per Cent
Convalescent serum	2,373	1,710	72.3	83	3.50
Other serums.....	451	354	78.5	13	1.61
No serum.....	885	708	80.0	8	0.90
All treatments.....	3,709	2,778	74.9	104	2.80

From Wesselhoeft's compilation (The Present Status of Serum Treatment in Acute Poliomyelitis, J. Pediat., 3: 330 [Aug.] 1933).

be more generally available and so be given credit for the lowered paralysis rate.

Fifth, contrary to common opinion, the dose of serum has no apparent relation to the outcome. In Jensen's series the "minimum therapeutic dose" for children was 30 cc., but even this could not always be given early in the epidemic. In Jackson's¹⁴ series the dose was only 20 cc., and in Laidlaw's¹⁵ report the dose was actually inversely proportional to the percentage of recoveries.

Sixth, different epidemics vary considerably in mildness and severity. Without controls, the outcome of the cases under treatment in reference to the quality of the epidemic as a whole cannot be correctly evaluated. Jensen's comment on his own cases would fairly apply to all uncontrolled series; he frankly said "It is quite impossible to state whether the serum-treated cases progressed more favorably than they would have done without serum."

In the series in which there are controls most of the objections cited are at least minimized. These studies have been criticized for failure to alternate treated and untreated patients and because the tendency not to withhold serum from some severely ill patients might have unfairly lowered the average recovery rates for the treated. Sampling errors can be weighed by comparing the results in the treated not only with the untreated but also with the two groups combined. At least one possible sampling error, owing to varying proportions of treated and untreated at different stages of an epidemic, may, as has already been shown, unduly favor the treated.

There are only a few controlled studies of considerable size based on preparalytic cases. That of Kramer and Aycock,¹⁶ with 80 cases, showed no

TABLE 1.—Convalescent Serum Treatment in Preparalytic Stage: Selected Series, No Controls

Authors	Number of Cases	No Residual Paralysis	
		Number	Per Cent
Macnamara, J., and Morgan, F. G.: Lancet 1: 527, 1932	76	72	95
Shaw, E. B., and Thelander, H. E.: Calif. & West. Med. 33: 754, 1930	23	23	100
McEneaney, J. M.; Chown, B.; Bell, L. G., and McKenzie, M.: Canad. Pub. Health J. 20: 235, 1929	74	70	96
Levson, S. O.: Illinois M. J. 70: 296, 1936	149	135	91
Cowle, D. M.; Parson, T. P., and Lowenberg, K.: Ann. Int. Med. 8: 521, 1934	80	76	96
Jensen ¹⁰	2,922	2,775	92
Jackson ¹⁴	395	340	86

rather than a certain diagnosis, even during an epidemic. In the large epidemic of 1934 in Los Angeles the question was raised by the U. S. Public Health Service and the California State Department of Public Health¹²

9. Schultz, E. W.: Immunity and Prophylaxis in Poliomyelitis, J. A. M. A. 107: 2102 (Dec. 26) 1936.
10. Jensen, C.: The 1934 Epidemic of Poliomyelitis in Denmark, Proc. Roy. Soc. Med. 28: 1007 (June) 1935.
11. Neal, J. B.; Du Bois, P. L.; Abramson, H. L., and associates: Report of the 1916 Epidemic of Poliomyelitis; from a Clinical and Laboratory Standpoint, Collected Studies of the Bureau of Labor, Dept. Health, New York City 9: 77, 1916-1919.
12. Leake, J. P.; Cedar, E. T.; Dearing, W. P.; Gilliam, A. G., and Choche, H. D.: Epidemiology of Poliomyelitis in California, 1934, Am. J. Pub. Health 24: 1204 (Dec.) 1934.

13. Riggins, I. C.: Poliomyelitis in Virginia During 1935, Am. J. Pub. Health 26: 98 (Feb.) 1936.
14. Jackson, F. W.: The 1936 Epidemic of Poliomyelitis in Manitoba, Canad. Pub. Health J. 28: 363 (Aug.) 1937.
15. Laidlaw, F. W.: Poliomyelitis in the State of New York in 1931: A Preliminary Study of 1,559 Cases, J. A. M. A. 99: 1053 (Sept. 24) 1932.
16. Kramer, S. D.; Aycock, W. L.; Solomon, C. I., and Thelander, C. L.: Convalescent Serum Therapy in Preparalytic Poliomyelitis, New England J. Med. 206: 432 (March 3) 1932.

advantage for treatment, but the data are not given in detail and are not included in the table. Laidlaw's report is not included because of the relatively small number in the untreated group; this showed 71 per cent recovery as compared with 77 per cent in the treated group. The report of Harmon, Krigsten and Harkins¹⁷ is given in the table although the 29 per cent recovery in the untreated group is so far below the 71 per cent average of all other reports on untreated preparalytic cases as compiled two years before by Harmon in another paper¹⁸ as to raise a serious doubt of the method of selection of cases. This is the only series in which a significant difference (by the chi square method) is found between the treated and the untreated and it accounts for the slightly higher percentage of recovery for the treated group in the totals.

There is now a considerable body of evidence on the possibilities and actual effects of serum treatment; a fair appraisal of it shows little to support the belief that it can be or is actually curative and a good deal to deny that belief. This could hardly occur even if a slight beneficial action existed such as might perhaps be enhanced by improved selection of serum or by its use in larger amounts.

While serum will probably be continued to be used on the basis that it is harmless, because there is no satisfactory substitute and in the belief that it may possibly do the individual patient some good, certain

bodies appears to be less than that of normal serum,¹⁹ and about 40 per cent of convalescents have no demonstrable antibody at all.¹⁷ The financial burden on many patients with poliomyelitis is heavy enough without it.

This part of the discussion can well be closed with a quotation from Zinsser,²⁰ who after discussing experi-

TABLE 5.—Convalescent Serum Treatment in Preparalytic Stage: Series with Controls

Authors	Number of Cases		Complete Recovery, Percentage		Deaths, Percentage	
	Con-trols	Treated	Con-trols	Treated	Con-trols	Treated
Park, W. H.: J. A. M. A. 99:1050, 1932; Fischer, A. E.: Am. J. Dis. Child. 48:481, 1934	404	539	80.7	79.5	1.24	3.90
Harmon, Krigsten and Harkins ¹⁷	31	63	29.0	88.9	Not stated	
Mal, H.: Muenchen. med. Wehnsehr. 85:393, 1938	15	26	26.7	30.8	Not stated	
Hyland, H. H.; Gardiner, W. J.; Heal, F. C.; Oille, W. A., and Solandt, O. M.: Canad. M. A. J. 39:1, 1938	32	26	81.5	84.6	0.94	1.15
Henningsen, E. J., and Rasch, G.: J. Hyg. 40:84, 1940	200	409	81.0	81.4	6.0	4.15
Total.....	682	1,063	74.9	78.5	3.14*	4.23*
Controls and treated combined	1,745		77.1		3.79*	

* Calculated from the 636 control and 974 treated cases in the series in which the deaths were reported.

TABLE 3.—Preparalytic Cases: All Serum Treated; Outcome in Relation to Day of Treatment

Onset of Meningitic State Before Treatment	Number	Percentage Developing Paralysis
Less than 1 day.....	802	4.1
1 day.....	913	5.5
2 days.....	652	6.7
3 days.....	283	17.0
4 days.....	125	12.0
5 days.....	78	14.1
6 days.....	50	18.0
More than 6 days.....	89	30.3
3 days or more.....	625	17.6
Entire epidemic.....	4,525	14.4

From Jensen.¹⁰

TABLE 4.—Serum-Treated Preparalytic Cases: Relation of Dosage to Complete Recovery

Dosage of Serum	Number of Cases	Percentage with Complete Recovery
30 cc. or less.....	98	83.7
30-60 cc.....	381	77.7
Over 60 cc.....	205	74.6

From Laidlaw.¹⁵

suggestions are in order. First, I believe that there should be no obligation, moral or legal, on the physician to give it; nor should he be held responsible for having withheld it if the outcome of the case is unfavorable. Second, there is no sound basis for the use of convalescent serum instead of the serum or whole blood of normal adults. The former is difficult to collect and inordinately expensive; its content of neutralizing anti-

mental work on viral antibodies said: "All these considerations should especially influence clinical views on the therapeutic use of antiserum. . . . Much money, effort and heartache could have been saved if these experimental facts had been considered before wholesale treatment with convalescent serum was exploited."

ACTIVE IMMUNIZATION

A solid immunity against most virus diseases is conferred by an attack of the disease itself, but this is not true of all of them, the common cold being one exception. It may be conferred by an attack of a closely related disease, artificially induced, of which vaccinia against smallpox is the best example. It may also, as in the case of yellow fever, be induced by injection of an attenuated, nonpathogenic strain of virus.²¹ Finally, in a few instances, among which influenza²² and equine encephalomyelitis²³ are conspicuous, it may be induced by the injection of fully inactivated virus. The differences between viruses in respect to their immunizing qualities are striking, and a method found effective against one is unlikely to be effective against another.

Poliomyelitis has been intensively investigated in search of a method that will be both effective and safe,

19. Shaughnessy, H. J.; Harmon, P. H., and Gordon, F. B.: Neutralization of the Virus of Poliomyelitis by Human Serum, J. Prev. Med. 4: 463 (Nov.) 1930.

20. Zinsser, Hans; Ender, J. P., and Fothergill, L. D.: Immunity: Principles and Applications in Medicine and Public Health, ed. 5, New York, Macmillan Company, 1939, p. 446.

21. Theiler, Max, and Smith, H. H.: The Use of Yellow Fever Virus Modified by In Vitro Cultivation for Human Immunization, J. Exper. Med. 65: 787 (June) 1937.

22. Horsfall, F. L., Jr., and Lennette, E. H.: A Complex Vaccine Effective Against Different Strains of Influenza Virus, Science 61: 492 (May 24) 1940.

23. Beard, J. W.; Beard, Dorothy, and Finkelstein, Harold: Vaccination of Man Against the Virus of Equine Encephalomyelitis (Eastern and Western Strains), J. Immunol. 38: 117 (Feb.) 1940.

17. Harmon, P. H.; Krigsten, W. M., and Harkins, H. N.: Problems Bearing on the Pathogenesis and Treatment of Acute Poliomyelitis, Illinois M. J. 73: 195 (March) 1938.

18. Harmon, P. H.: Poliomyelitis, Am. J. Dis. Child. 47: 1179-1255 (June) 1934.

but Flexner²⁴ in 1935 came to the conclusion that these two basic requirements were mutually exclusive; any method that was effective had the danger of producing the disease, and all inactivated vaccine failed to protect satisfactorily. Olitsky and Cox²⁵ in the following year concluded their own experimental work by remarking: "A study of the recorded experiments of the past twenty-five years reveals that poliomyelitis virus itself is not a potent antigen, as are some other viruses; uniform protection is rarely brought about through its use."

It was at this period that two large scale experiments on active immunization of human beings²⁶ were terminated abruptly because of the dangers encountered.²⁷

It has even been questioned²⁸ whether an attack of poliomyelitis gives a solid or lasting protection against future attacks; the number of second attacks of the disease in the same person may be large enough to agree with expectancy on the basis of no immunity from the initial attack. The point is not, however, proved.

Discouraging as past experience has been, the field of future investigation is far from being closed. The search for an attenuated living virus should go on.

A new line of investigation will be open when a method of artificial cultivation of virus is available which will supply large amounts of virus. It is reasonable to question whether the low antigenicity of the vaccines that have hitherto been used is simply qualitative; it may actually be quantitative and, if so, the use of larger doses might prove effective. Hitherto, as Sabin and Olitsky²⁹ found, it has been possible to grow poliomyelitis in vitro only on human embryonic tissue—a method of extremely limited value for quantity production.

It may be that success in preventing poliomyelitis will come not from the methods of classic immunology but from some simpler chemical procedure—whether it is use of hormones or vitamins or something else—that will modify intracellular metabolism so that the natural host cells will no longer be suitable for invasion and multiplication of virus. The conditions that make them suitable are narrowly limited and delicately balanced. The chemical differences in composition of the anterior horn cells, which are susceptible, and those of many other neurons which are not, cannot be very great, and there is reason to suppose that even in the former the implanted virus dies out in many cases by the process which Pette³⁰ calls autosterilization, without causing death of the cells. It does not appear to be beyond the range of possibility that physicians will some day know the secret of this process and perhaps learn how to control it.

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24. Flexner, Simon: Concerning Active Immunization in Poliomyelitis, *Science* 82:420 (Nov. 1) 1935.

25. Olitsky, P. K., and Cox, H. R.: Experiments on Active Immunization Against Experimental Poliomyelitis, *J. Exper. Med.* 63:109 (Jan.) 1936.

26. Brodie, M., and Park, W. H.: Active Immunization Against Poliomyelitis, *Am. J. Pub. Health* 26:119 (Feb.) 1936. Kolmer, J. A.: Vaccination Against Acute Anterior Poliomyelitis, *Am. J. Pub. Health* 26:126 (Feb.) 1936.

27. Leake, J. P.: Poliomyelitis Following Vaccination Against This Disease, *J. A. M. A.* 105:2152 (Dec. 28) 1935.

28. Fischer, A. E., and Stillerman, Maxwell: Does an Attack of Acute Anterior Poliomyelitis Confer Adequate Immunity? Report of Four Second Attacks in New York City in 1935, *J. A. M. A.* 110:569 (Feb. 19) 1938.

29. Sabin, A. B., and Olitsky, P. K.: Cultivation of Poliomyelitis Virus in Vitro in Human Embryonic Nervous Tissue, *Proc. Soc. Exper. Biol. & Med.* 34:357 (April) 1936.

30. Pette, H.: Tierexperimentelle Studien zur Frage der "Viruswanderung" im Nervensystem: zusammenfassende Betrachtungen (Mechanismus der Wanderung), *Deutsch. Ztschr. f. Nervenh.* 122:221, 1931.

THE USE OF THE RESPIRATOR

JAMES L. WILSON, M.D.

DETROIT

I think it is clear to all that the subject of the use of the respirator is included in this program not because of its scientific importance as compared with the other matters discussed but because the respirator has aroused a great deal of interest and obtained a dramatic hold on the lay mind, and because the question of its use confronts a physician in respect to every patient who dies a victim of poliomyelitis.

The most important problem that arises, and the one that first enters the mind, is one for which I cannot offer a statistical answer, nor do I think it is worth long discussion here. The question concerns the ultimate value of the respirator in the treatment of poliomyelitis, and it arises because of the painful experience that physicians have had with patients who have survived after long and expensive dependence on a respirator but who are so extensively paralyzed that one can wonder as to the value of their lives to themselves or to others. In regard to these few patients one quickly moves into questions of philosophy and ethics which are not necessary to discuss here. One crucial point must concern the physician, one which I wish I could emphasize again and again: At the time that the decision to use the respirator must be made it is impossible to make an accurate prognosis as to the future value of the individual whose life the physician is trying to save.

A survey of all the patients with poliomyelitis treated in respirators in this country during 1940 has recently been made. It was impossible to make it complete or entirely accurate, but figures of considerable interest were obtained. Somewhere between 400 and 500 patients were treated last year. Of the patients for whom the use of the respirator was clearly indicated—that is those with simple intercostal or diaphragmatic paralysis, who made up one third of the total—less than 20 per cent died. It is evident that a great many patients recovered as competent individuals, but it is impossible from any data yet available to get figures which would quantitate the amount of permanent handicapping.

There were two important observations: one, that a large number of these patients had conditions for which the use of the respirator was probably not indicated; second, that a large number of patients were put in the respirator at periods of their illness far later than that which the best practice of medicine would demand.

Two thirds of the patients treated last year had bulbar paralysis; that is, they had pharyngeal paralysis. Of these, two thirds died. These patients have often severe respiratory difficulty, usually due to unswallowed pharyngeal secretions. Difficult breathing from this cause alone cannot be helped by a respirator. The use of the respirator is clearly indicated only when the difficulty is due to intercostal or diaphragmatic paralysis. However, it cannot be said that in many instances in which there is pharyngeal paralysis there is not actually weakness of the respiratory muscles as well, which would give indications for care with the respirator. The greatest clinical acumen is sometimes necessary to detect actual intercostal or diaphragmatic weakness when respiration is continually interrupted by unswal-

lowed pharyngeal secretions. Long periods at the bedside with careful observation of the breathing of the patients is necessary, because many with good respiratory muscles will breathe shallowly and will seem unable to take a deep breath when they have fear of choking on secretions from the upper respiratory tract. Often considerable help can be obtained by a careful examination for weakness of the shoulder muscles and for weakness of the neck, which are invariably associated with intercostal paralysis and with diaphragmatic paralysis.

One fourth of the patients were put in the respirator for the first time on the seventh day of their illness or later. Only one half were put in on the fourth day of their illness or earlier. This indicates a widespread delay in the institution of treatment and brings me directly to what I think is one of the most important rules to be followed for treatment with the respirator. Patients should be treated early. The validity of this rule must necessarily rest on the principle that underlies all orthopedic treatment, that which demands early protection by the use of splints or sandbags or casts of any paralyzed muscle. Although the theoretical basis for this principle of treatment is, I believe, not wholly clear, long experience has convinced all that it is sensible. Apparently one may expect less total paralysis and certainly less deformity by a rigid application of this principle of treatment. There is no reason why the same rule should not apply to the care of the intercostal and the diaphragmatic muscles as to care of the biceps. The respiratory muscles can be protected in a respirator. The parallelism between the action of a respirator and that of a splint is certainly not exact, but this machine gives the respiratory muscles the nearest possible approach to the rest given by a splint to a biceps. Here argument can quickly get involved with unproved theoretical considerations, but one would expect less use of sick anterior horn cells to occur with muscles passively moved than with those actively moved.

The use of the respirator in most physicians' as well as laymen's eyes is still limited to dire emergencies as a last and dramatic effort to preserve life. This necessarily restricts the interest in the use of the respirator to the most serious cases, in which actually, in terms of final competence of the patients, one can hope to accomplish the least. I believe, though I cannot prove it, that one would probably do more good and save more muscles by using a machine to give rest to several partially paralyzed patients who might well survive without the benefit of a respirator than to save the life of one terribly paralyzed.

Attempts to use the respirator early in disease brings one face to face with several practical problems.

The first involves a general principle of artificial respiration, which I will take time here to discuss. Artificial respiration of all types is most successfully carried out when the patient is making no attempt to breathe himself. A patient's own effort to breathe, particularly when it is irregular and interrupted, as in pharyngeal paralysis, may completely prevent any form of artificial respiration, certainly that with the Drinker type of respirator, from being effective. Anxiety and fright may prevent a patient from relaxing in a respirator and from getting any benefit from it. It follows, therefore, that when a respirator is used early, before the patient feels desperately in need of help, it is apt at

first trial to seem ineffective. To use a respirator under these conditions requires a great deal of skill and patience, and sometimes several trials. All possible tact in handling an anxious, frightened patient is necessary.

A second problem is the diagnosis of early paralysis or the detection of partial paralysis of the respiratory muscles, a subject which deserves a longer discussion than can be afforded here. I have confidence that in orthopedic clinics all over the country there are numerous examples of undetected partial paralysis of intercostal muscles or of the diaphragm. The detection of early respiratory paralysis or one of moderate degree depends on accurate observation and on an evaluation of functional capacity which requires some experience. Often a sharp reduction in respiratory capacity is evidenced only by slight motion of the nostrils on breathing, or the patient may avoid speech, or talk only by interrupting each few syllables for a breath. Perhaps one of the simplest things to do is to ask a suspected patient to count and see how many numbers he can repeat with one breath. Cyanosis, severe dyspnea, air hunger—all are symptoms of a desperate need for oxygen, which when due to paralysis of the respiratory muscles indicates that the respirator should have been used long before.

A third problem brought about by early treatment arises because of the form of the machine itself, as it is large, cumbersome and frightening. What is more, if it is not available and at hand it is apt to be costly to make it so. The decision to move a patient to a respirator or a respirator to a patient is one that involves a great deal of expense, trauma and trouble and stirs up an intense anxiety and fear. It is hard to make that decision as early as it should ideally be made, especially if the only available respirator happens to be at a distance and it is obvious that some action needs to be initiated before it is quite clear that a patient will or does need a respirator.

I have no answer for this last problem except to hope that the new types of cuirass respirators will become cheap and effective. Unless some such development does take place or unless the present expensive and cumbersome tank respirators become far more common than they are at present, our lay public will continually be impressed by dramatic accounts of dashing ambulances with police escorts moving respirators or suffering patients, each incidence of which will probably indicate an unsatisfactory solution of an emergency which better should not have arisen.

Before I close, I must add one word about the treatment of victims of bulbar palsies, or more specifically those with pharyngeal paralysis. In any poliomyelitis epidemic these outnumber the patients with paralysis of respiratory muscles by a good deal. Since their difficulties are due to bulbar involvement, the respirator cannot help and may do harm. Although the discussion of this does not come within the topic assigned to me, I wish to emphasize that possibly more can be accomplished by properly handling these patients than those for whom the respirator is indicated. Postural drainage, gentle aspiration of the throat, avoidance of excitement, and even sometimes in very carefully studied instances, tracheotomy will do much to save life. The nonspecific treatment of bulbar poliomyelitis deserves more attention.

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EARLY ORTHOPEDIC CARE IN
POLIOMYELITIS

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The type of orthopedic care indicated for those individuals who have recently experienced an attack of poliomyelitis is based on the pathologic processes in both the spinal cord and the skeletal muscles. It is essential to interpret correctly these pathologic processes in terms of the altered anatomy and physiologic function before effective treatment can be instituted. Furthermore, the degree of muscle improvement it is ultimately possible to obtain is determined by the severity and distribution of this pathologic condition.

The first objective in treatment is to preserve all potential neuromuscular units that remain anatomically intact and to maintain the skeleton in proper alignment.

2. Anterior horn cells temporarily altered in function by edema and congestion of the acute inflammatory process (fig. 2).
(a) Anatomically the unit remains intact.
(b) Physiologic function of cell and neuromuscular unit temporarily shut off.

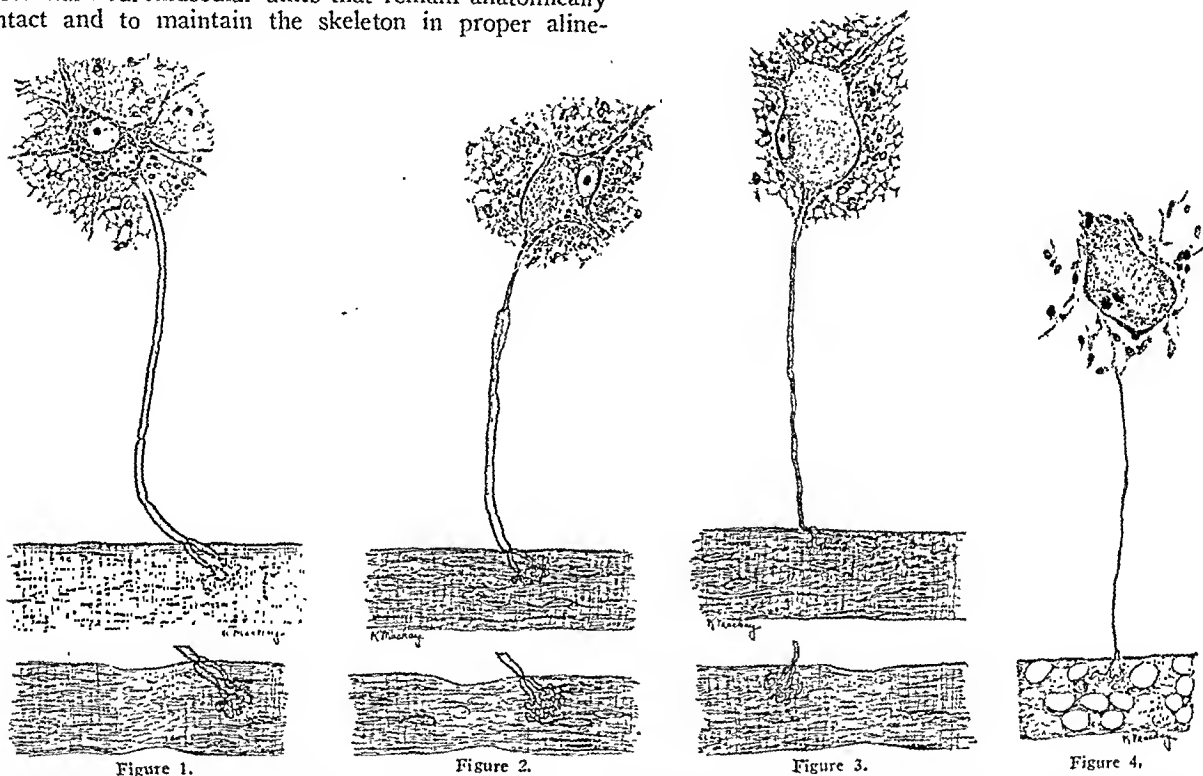
3. Partial destruction by toxin of virus (fig. 3).

(a) Anatomic continuity temporarily altered.
(b) Physiologic function diminished or absent.

4. Complete destruction (fig. 4).

(a) Anatomic continuity is broken.
(b) Restoration of physiologic function is impossible. In the reparative process the anterior horn cell is replaced by scar tissue. This scar tissue cannot generate or transmit nerve impulses. The axon or nerve fiber disintegrates. The representative muscle fiber undergoes fatty degeneration and ultimate fibrosis. No type of treatment will alter this condition.

How does the increase in muscle strength come about? The important point to be emphasized is that



Figs. 1, 2, 3 and 4.—Ways in which anterior horn cells respond to invasion of virus: Fig. 1.—Anterior horn cell remains normal without involvement. Fig. 2.—Anterior horn cell temporarily altered in function by edema and congestion of the acute inflammatory process. Fig. 3.—Partial destruction by toxin of the virus. Fig. 4.—Anterior horn cell completely destroyed. The upper strip of muscles in these illustrations represents normal tissue capable of normal function. The muscle tissue in figures 1, 2 and 3 in the lower strip is pathologic because of lack of proper orthopedic care during the acute stage. In figure 4 the pathologic condition of the tissue is due to complete destruction of its representative anterior horn cell.

ment while the protection of these units is being carried out. It is important to realize that intact anatomic units immediately after the acute disease cannot all function as physiologic units. A paralyzed muscle fiber will not contract until its physiologic processes have been restored, and its physiologic processes cannot be completely restored if there has been a break in the anatomic continuity.¹ By way of illustration, let me briefly review the acute pathologic process in the cord as far as it pertains to muscle function.

The anterior horn cells respond to the invasion of the virus in at least four ways:

1. Anterior horn cells remain normal, without involvement (fig. 1).

(a) Normal anatomic unit.

(b) Normal physiologic unit.

1. Hipps, H. E.: Muscle Pathology in Anterior Poliomyelitis: Its Relation to Function. South. M. J. 34: 135 (Feb.) 1941.

any increase in motor power that might occur in a given muscle or group of muscles of an individual during convalescence is not due to hyperplasia of either anterior horn cells or muscle tissue. The increase in muscle power comes from two sources (figs. 1, 2 and 3, upper strip), (1) the natural restoration of the physiologic function of the nerve cells of neuromuscular units temporarily thrown out of action by the acute disease and (2) hypertrophy of the muscle tissue of normal units that have been spared by the infecting organism. In both instances anatomic continuity has not been broken. Improvement in the spinal cord of this nature will take place regardless of whether or not any treatment is given. I believe that this type of improvement explains the rapid return of muscle power made during the first few weeks after an acute attack and explains why a patient eventually is able to live

without a respirator when it was necessary to save his life during the height of the acute illness. As soon as the edema and congestion subside a great number of anterior horn cells return to function.

If improvement in the cord takes place as just described, what is the purpose of early orthopedic care? As already stated, no type of treatment will alter those units which are completely destroyed. If the greater percentage of the total fibers of any muscle or groups of muscles is damaged to this extent, they will remain useless regardless of what is done. The object of treatment, then, is to protect the normal tissue that remains and to preserve anatomic continuity of all muscle fibers in which the representative nerve cells are potentially intact but are temporarily unable to function physiologically. When these two aims are properly carried out, all the potential strength of the patient has been preserved and his status, so far as muscle power is concerned, is established. He is now in the chronic stage of the disease. Without proper care and protection these muscle fibers are easily stretched even to the point of rupture (figs. 1, 2 and 3, lower strip). They are temporarily without tone, owing to loss of the normal nerve impulse. They are particularly vulnerable during this period. Once ruptured, the muscle fiber is invaded by scar tissue, and when the representative nerve cells regain their physiologic function a normal wave of muscle contraction is impossible owing to the break in anatomic continuity. This break in continuity can be brought about by overactivity, whether it is too deep and vigorous massage, overexercise, early weight bearing, inadequate support or overstimulation. If rupture in muscle fiber occurs, then hypertrophy is forever impossible.

Hipps¹ recently presented an interesting study of gross pathology of muscles in poliomyelitis. Through the courtesy of Dr. Hipps and the publishers two drawings are shown (figs. 5 and 6). These drawings were made from actual specimens at the time of operation. Note the zones of fibrosis completely traversing the muscle belly in both specimens. The quantity of muscle tissue actually present was estimated to be 90 to 95 per cent of normal but the functional power was only 20 per cent. This transverse zone of fibrosis can be explained by sudden trauma causing rupture of the fibers while they were lacking in tone because of temporary loss of function of the representative anterior horn cells. These drawings well illustrate the importance of meticulous care during the first few months.

All that has been stressed in this paper so far has been acutely diseased tissue. The treatment of acutely diseased tissue in poliomyelitis is no different from the treatment of acutely diseased tissue in any other illness. The first and most important indication is absolute and complete rest and no exercise. Exercise is contraindicated as much in these cases as in cases of acute myocarditis or overfeeding a patient with intestinal ulcerations following typhoid.

The entire treatment program for a patient who has had an attack of anterior poliomyelitis is adequately summed up in the diagram reproduced in figure 7. The program divides itself into three phases: (1) the treatment indicated during the acute stage, (2) that which is indicated during the chronic stage and (3) the treatment indicated during the period of resumed activity (fig. 7).

The orthopedic care during the acute phase is concerned with (1) the preservation of all the potential muscle power that has been spared by the acute infec-

tious process and (2) maintenance of the skeleton in proper alinement while these potential neuromuscular units are being protected.

The treatment carried out during this acute phase is designed to salvage everything of value from the wreckage caused by the devastating invasion of the infecting organism.

When the patient is making no further improvement—when there is nothing more to salvage—the condition passes into the chronic stage. We are now concerned with bringing together, or assembling, all that has been salvaged and supplementing indicated surgical procedures and the fitting of permanent braces. The result is an individual who, though resembling his former normal appearance, is handicapped in varying degrees as to his former normal function. The patient is now



Figure 5.

Fig. 5.—Muscle grade, trace. Zone of fibrofatty degeneration with good muscle above and below.



Figure 6.

Fig. 6.—Muscle grade, poor. There is a zone of fibrofatty degeneration across a fairly good muscle. A contraction in either muscle belly is ineffectual because of this zone. This may have resulted from a stretch tear or perhaps from the pressure of the calf band or brace.

ready to resume his former activity as completely as is possible. As limited as it might ultimately be, the purpose now is to teach the patient as much independence as possible by instructing him to use to the best advantage all that has been saved and accomplished by treatment during the acute and chronic stages.

Only the principles of that treatment indicated during the acute stage will be discussed at this time. It is impossible to outline a treatment program for the acute convalescent stage that fits every patient. They are all individual problems. Complete rest is the basic principle of treatment which I wish to emphasize. This period of treatment may vary from a period of two months to as long as a year, depending on the distribution and the severity of involvement. The principle of rest should be continued as long as there is increase

in muscle power which later will be of some practical functional value to the patient. At the same time one must condemn prolonged treatment of this type on muscles or groups of muscles in which the strength has persistently remained less than 50 per cent. This is particularly true of muscles in the weight bearing extremities. It is useless to carry a severely damaged

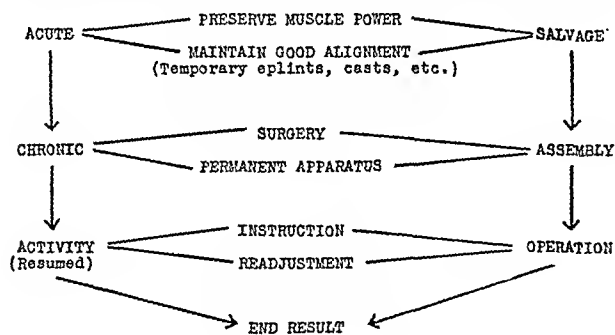


Fig. 7.—Treatment program.

muscle through a series of passive motions when actually there is no muscle tissue to exercise. This does not mean that all treatment indicated during the acute stage should be discontinued, the patient classed as chronic and immediately put on his feet with braces and crutches. As an example, one should discontinue treatment of lower extremities that remain flail but continue efforts directed at the trunk and upper extremities, which must later take over the function of weight bearing.

In addition to recumbence and non-weight bearing, adequate rest is best provided by plaster casts. Plaster has the advantage over removable splints in several ways. Nursing care of a patient in a properly applied cast is much easier. Casts are comparatively inexpensive and are more positive, and pressure is evenly applied over the entire extremity. The patient is more comfortable. No immediate attempt should be made to make a complete muscle analysis. It causes the patient too much discomfort and it can't possibly be correct. In cases of lower extremity involvement the hips, abdomen and lower part of the back are almost always involved. A well padded double spica is the most satisfactory method of providing adequate support. The body portion should extend well over the lower costal margins. This splints the abdomen and supports the back. The normal lumbar lordosis must be preserved. The thighs should be slightly internally rotated, the knees flexed 10 to 15 degrees, the knee and ankle joints maintained in the same vertical plane, and the feet in slight equinus and varus. In shoulder girdle involvement, casts are used as soon as the condition of the patient permits. A body jacket is applied including the arm as far as the elbow. Care must be taken to keep the shoulder tips depressed. The upper trapezius is almost always spared. Its unopposed action elevates the shoulder tip and rotates the scapula outward. The arm is placed in 60 degrees abduction and 45 degrees forward flexion. Never immobilize the fingers and hands in plaster. These joints should have some motion every day. When the physical condition of the patient will not permit plaster on the trunk and upper extremities, overhead slings are quite satisfactory (fig. 8).

As soon as tenderness subsides, a complete and accurate muscle analysis is essential. This test forms the basis of future treatment. If indicated, the casts are

reapplied with the parts supported in the position the muscle weakness and imbalance require.

Exercises should not be started until improvement from immobilization ceases or restriction of joint motion becomes apparent. I feel that exercises following this period of prolonged rest are best provided in a medium of warm water. Hydrotherapy is often continued three or four months before weight bearing is started. I feel that further improvement in muscle power from hydrotherapy is due to hypertrophy of muscle tissue that remains.

For patients who need respirator care the abdomen should be splinted by a corset or suitable binder as soon as the physical condition will allow. If this is not done, the patient will become an abdominal breather and the chest wall will contract in the position it assumes at the end of expiration. If and when there is a return in power of the muscles of respiration, they cannot elevate the rib cage because of the contraction.

Much has been written on the formation of kidney stones following prolonged immobilization, the most recent article appearing in *THE JOURNAL*.² Frequent change in position and intake of large quantities of water aid in better drainage and prevention of stone formation. Roentgenograms of the kidney region at intervals should be made to detect these stones in the early stage.

No attempt has been made in this paper to describe in detail early orthopedic treatment of the poliomyelitis

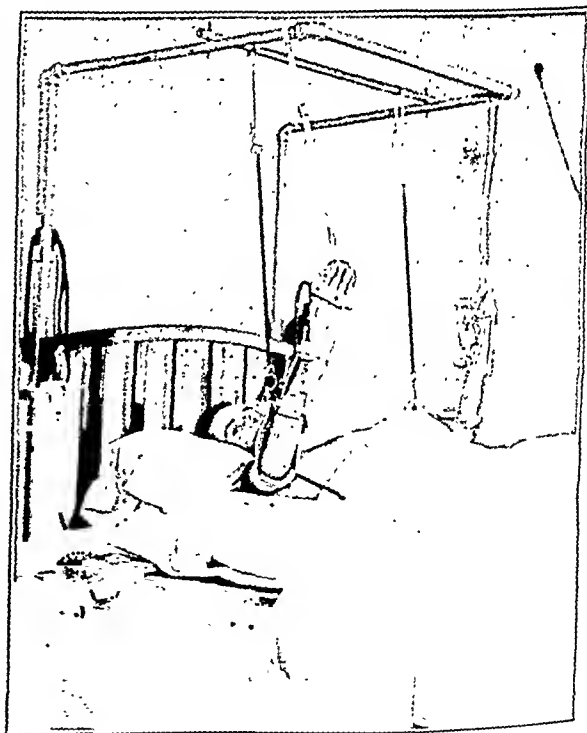


Fig. 8.—Overhead sling.

patient. My purpose is to emphasize the importance of complete rest during early convalescence. During this period of complete rest, spontaneous recovery in muscle power takes place as described. Following this spontaneous recovery, supervised exercise in warm water further increases muscle power by hypertrophy of the muscle tissue that has been spared by the disease.

2. Boyd, M. L.: The Formation of Renal Calculi in Bedridden Patients, *J. A. M. A.* 116: 2245 (May 17) 1941.

Clinical Notes, Suggestions and New Instruments

CARCINOMA OF THE ISLANDS OF LANGERHANS WITH HYPOGLYCEMIA AND METASTASIS TO THE LIVER

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After the discovery of insulin in 1922 the signs and symptoms of acute hypoglycemia became well known. These, in cases of mild involvement, were weakness, perspiration and anxiety and in severe instances more serious mental changes, convulsions, coma and death. The mental changes have received more attention lately, especially in association with insulin therapy in some of the psychoses. Apparently the hypoglycemic effect on nervous tissue may reach a point at times which is irreversible. Malamud and Grosh¹ and Klein and Ligterink² have discussed this problem, recently.

Hypoglycemia may be due to many causes—pituitary tumors; adrenal cortical tumors; advanced hepatic disease such as yellow atrophy, carcinoma or fatty infiltration in which 70 to 80 per cent of hepatic substance is replaced; cachectic states; excessive physical exercise, and, most spectacularly, to tumors of the island cells of the pancreas.

Since Harris³ first described this condition as hyperinsulinism in 1924, the subject has received considerable attention in the literature. Wilder⁴ gave an excellent review in 1936 and Whipple and Frantz⁵ in 1935. The latter report covered 62 cases of tumor of the islands of Langerhans. The great majority of the tumors were benign adenomas. In certain instances it was difficult to determine whether the tumor was benign or malignant. Only three of those considered malignant had hepatic metastases. Apparently these tumors grow slowly and metastasize slowly. Howland, Campbell, Maltby and Robinson⁶ reported in 1929 a case of islet carcinoma which was removed surgically, and the patient was still alive and well in 1939. No metastases to the liver were found at operation. Joachim and Banowitch⁷ in 1938 reported a case of carcinoma of the islands of Langerhans without hepatic metastasis; the patient died six weeks after operation, and no autopsy was obtained. Hamdi⁸ discovered an islet cancer at autopsy; there was no mention of hypoglycemia clinically, but the cancer did have hepatic metastases sections of which showed typical islet cells.

The first case in the literature of carcinoma of the islands of Langerhans with hypoglycemia and metastases to the liver was reported by Wilder, Allan, Power and Robertson⁹ in 1927. They were able to make an extract from the hepatic metastases and by injection into rabbits produced an insulin-like reaction. This beautiful piece of work clearly proved the hyperinsulinism concept of Harris³ and showed conclusively that the hypoglycemia in islet tumors is caused in large part by insulin produced without nervous control by the tumor cells rather than by a general stimulation by the tumor of the normal

islet cells. In 1937 Cragg, Power and Lindem¹⁰ reported another case in which an insulin-like substance was demonstrated in an alcoholic extract of the hepatic metastases. Reports of 2 other cases of hypoglycemia and metastasis to the liver have appeared in the literature—1 by Judd, Faust and Dixon¹¹ in 1934, in which no metastatic extract was made and 1 by Bickel, Mozer and Junet¹² in 1935, in which demonstration of insulin in the hepatic nodules was unsuccessful.

To these 4 cases, we now add a fifth.

REPORT OF CASE

History.—A white woman aged 45 of Scotch-Irish descent, a housewife, was admitted to the medical service on Feb. 25, 1940 in a semicomatose condition.

In the fall of 1939 the patient started to complain of abdominal pain after eating, especially after eating fried food. Sodium bicarbonate gave relief. After several weeks, in addition to the complaint just mentioned, she began to have spells of "faintness" with numbness about the lips and in her extremities, but she showed no loss of muscular power or complete loss of consciousness. She obtained complete relief from these attacks with the intake of warm drinks and food. During the two weeks prior to admission she had more frequent and longer attacks of faintness and at times had to be roused by physical stimulation applied by the family. On February 23 she went to bed feeling well and was apparently rational but failed to

TABLE 1.—Blood Sugar Content

Time	Blood Sugar, Mg. per 100 Cc.
9 a. m.	89
One-half hour after ingestion of 50 Gm. of dextrose	81
One-half hour after ingestion of second 50 Gm. of dextrose	153
One hour after ingestion of second 50 Gm. of dextrose	213
Two hours after ingestion of second 50 Gm. of dextrose	208
Four hours after ingestion of second 50 Gm. of dextrose	106

TABLE 2.—Blood Chemistry

2/28/40	Carbon dioxide combining power	60.3 vol. per cent
2/26/40	Blood urea nitrogen	11.0 mg. per 100 cc.
3/2/40	Blood chlorides (as NaCl)	503 mg. per 100 cc.
3/2/40	Blood calcium	10 mg. per 100 cc.
3/2/40	Blood phosphorus	2.8 mg. per 100 cc.
3/1/40	Blood cholesterol	147 mg. per 100 cc.
3/7/40	Icteric index	11.6

be aroused the next morning even with stimulation. During this attack she was unable to speak to or recognize any one, appeared rigid, had glassy, watery eyes and frothed at the mouth. She remained in this condition for about eighteen hours, after which she was able to walk with aid but could not speak or recognize members of her intimate family. When she failed to improve after twenty-four hours she was brought to the hospital.

Cholecystotomy had been performed in 1922. The patient stated that the gallbladder was not removed at that time because there were "too many adhesions." In 1923 she fell down a flight of stairs, striking her head, but suffered no fracture of the skull. Her menstrual history had been entirely normal except that her two last periods had been rather prolonged but scant, and for this reason theelin was administered by her family physician.

Physical Examination.—The patient was moderately obese. When she was examined on admission she was lying quietly in bed, apparently stuporous, and staring into space. Her skin was warm and moist and showed no abnormalities except that there was a small amount of hair on the upper lip and a

From the Medical Service and Pathologic Laboratory of the Delaware Hospital.

1. Malamud, Nathan, and Grosh, L. C., Jr.: Hyperinsulinism and Cerebral Changes: Report of a Case Due to an Islet Cell Adenoma of the Pancreas. *Arch. Int. Med.* 61: 579-599 (April) 1938.

2. Klein, F., and Ligterink, J. A.: Insulin and Cerebral Damage. *Arch. Int. Med.* 65: 1085-1096 (June) 1940.

3. Harris, Sealie: Hyperinsulinism and Dysinsulinism. *J. A. M. A.* 83: 729-733 (Sept. 6) 1924.

4. Wilder, R. M.: Spontaneous Hypoglycemia. *Internat. Clin.* 3: 143-163 (Sept.) 1936.

5. Whipple, A. O., and Frantz, V. K.: Adenoma of Islet Cells with Hyperinsulinism. *Ann. Surg.* 101: 1299-1335 (June) 1935.

6. Howland, Goldwin; Campbell, W. R.; Maltby, E. J., and Robinson, W. L.: Dysinsulinism: Convulsions and Coma Due to Islet Cell Tumor of the Pancreas, with Operation and Cure. *J. A. M. A.* 93: 674 (Aug. 31) 1929.

7. Joachim, Henry, and Banowitch, M. M.: A Case of Carcinoma of the Islands of Langerhans with Hypoglycemia. *Ann. Int. Med.* 11: 1754-1759 (March) 1938.

8. Hamdi, H.: Ein insulargenetisches Pankreas-carcinom (Insulom). *Ztschr. f. Krebsforsch.* 37: 411-413, 1932.

9. Wilder, R. M.; Allan, F. N.; Power, M. H., and Robertson, H. E.: Carcinoma of the Islands of the Pancreas: Hyperinsulinism and Hypoglycemia. *J. A. M. A.* 89: 348-355 (July 30) 1927.

10. Cragg, R. W.; Power, M. H., and Lindem, M. C.: Carcinoma of the Islands of Langerhans with Hypoglycemia and Hyperinsulinism. *Arch. Int. Med.* 60: 88-99 (July) 1937.

11. Judd, E. S.; Faust, L. S., and Dixon, R. K.: Carcinoma of the Islands of Langerhans with Metastasis to the Liver Producing Hyperinsulinism: Report of a Case. *West. J. Surg.* 12: 555 (Oct.) 1934.

12. Bickel, Georges; Mozer, J. J., and Junet, R.: Diabète avec dénutrition grave: Disparition de la glycosurie et atténuation progressive de l'hyperglycémie à la suite du développement d'un carcinome insulaire du pancréas avec métastases hépatiques massives. *Bull. et mém. Soc. méd. d. hôp. de Paris* 51: 12-21 (Jan. 21) 1935.

masculine distribution of pubic hair. The pupils reacted sluggishly to light; the scleras and conjunctivas were clear. There was moderate edema of both retinas, but the disks and vessels appeared normal. Oral hygiene was poor. The tongue had a thick, whitish coating and the nasopharynx was moderately injected. Tonsils were present but were not hyper-

irregular, ill defined mass in the epigastrium. There was moderate rigidity of the left extremities; the patient seemed to resist passive motion. Flexion of the left knee caused the patient to groan, though no evident abnormality was noted in this region. Deep and superficial reflexes were present, physiologic in reaction and equal on the two sides. Vaginal examination revealed no evidence of a malignant growth, no mass in the pelvis. Rectal examination gave negative results. There was constant urinary incontinence.



Fig. 1.—Pancreas with tumor adjacent to normal parenchyma; $\times 98$.

trophied. The neck was not rigid, the thyroid not enlarged and the trachea not deviated. Except for occasional subcrepitant rales at the base of the right lung, the lungs were clear. The heart showed no abnormalities clinically, and the pulse was regular in rhythm and of good quality. The blood pressure was 120 systolic and 80 diastolic. The breasts contained no

Laboratory Reports.—A catheterized specimen of urine on February 25 was acid in reaction, with a specific gravity of 1.027, a faint trace of albumin but no sugar; there were 5 to 6 white blood cells in each high power field; no pus cells but occasional hyaline casts, much mucus and many epithelial cells were seen. Other specimens showed many pus cells. The urine showed no bile pigment and urobilinogen. The blood showed hemoglobin, 80 per cent; red blood cells, 4,500,000, and white blood cells, 14,300. The differential count showed polymorphonuclears, 58 per cent, of which 47 per cent were mature; 11 per cent band cells, 8 per cent large mononuclears, 33 per cent small mononuclears and 1 per cent basophils.

A determination of the blood sugar taken on admission was too low to read with accuracy, probably 20 mg. per hundred

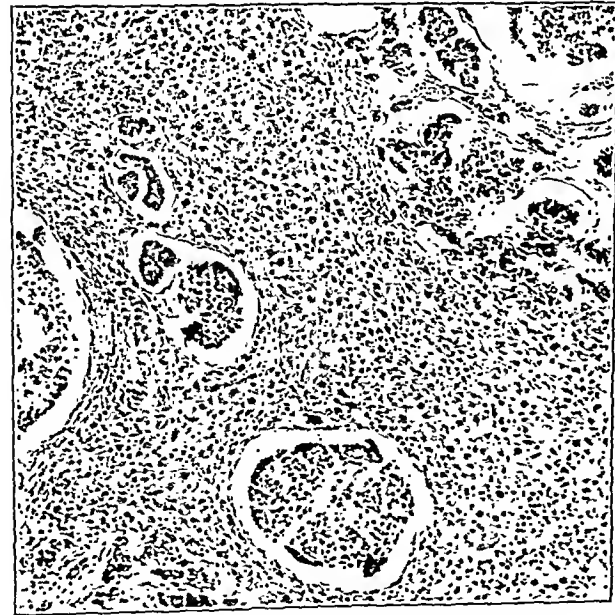


Fig. 2.—Liver with tufts of metastatic island cells; reduced from a photomicrograph with a magnification of 150 diameters.

masses. There was moderate distention of the abdomen but no rigidity. Two healed incisional scars were present over the lower part of the abdomen. The edge of the liver was palpable about two fingerbreadths below the right costal margin. No abnormal viscera or masses were felt on first examination, though subsequent examination revealed the presence of an

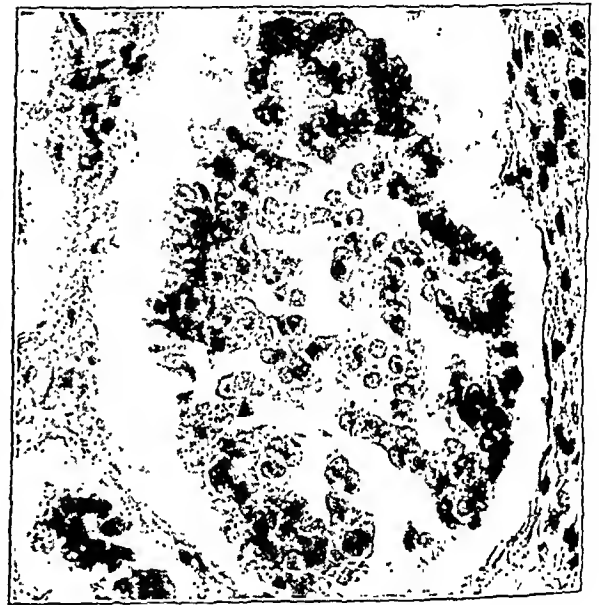


Fig. 3.—Hepatic metastasis; reduced from a photomicrograph with a magnification of 600 diameters.

cubic centimeters, and another the following morning was 51 mg. per hundred cubic centimeters after intravenous intake of about 85 Gm. of sugar during the night. About two hours after injection of epinephrine plus 300 cc. of a 15 per cent dextrose solution, the blood sugar content was 125 mg. per hundred cubic centimeters, and six hours later it dropped to 29 mg. per hundred cubic centimeters. A dextrose tolerance test was performed on February 28. It was necessary to give the patient 8 ounces (240 cc.) of orange juice every three hours the preceding night to avoid coma.

The urine showed 3 plus dextrose in all specimens.

Bromsulphalein and galactose liver function tests were not made.

A chloride excretion test after the method of Cutler, Power and Wilder¹³ to rule out adrenal insufficiency resulted as is shown in table 4.

The blood chloride content during the test was 561 mg. per hundred cubic centimeters. Fifteen grains (1 Gm.) of potassium citrate was given on the day before the test was started and repeated on the following day. Fluid intake on

13. Cutler, H. H.; Power, M. H., and Wilder, R. M.: Concentration of Sodium, Chloride and Potassium in Blood Plasma and Urine of Patients with Addison's disease: Their Diagnostic Significance. Proc. Staff Meet., Mayo Clin. 12: 244-249 (April 20) 1934.

the first day of the test was 2,700 cc. and 1,360 cc. for the remaining period of the test. Comparative figures showed a rather low urinary chloride content as a result of the aforementioned test. Adrenal insufficiency would give increased chloride excretion. A roentgenogram of the sella turcica showed no erosions of the clinoid processes or any evidence of pituitary tumor.

Course in Hospital.—The patient remained in a stuporous state for about seventy-two hours after admission, after which she became somewhat brighter but still was unable to speak coherently. However, she obeyed requests to turn her head or raise her arms. About twelve hours after the first spinal tap, she appeared even more bright and was coherent in her speech, giving a fair history of her condition in the past by answering simple questions. However, she soon lapsed back into the stuporous condition but was brought out of this with intravenous injections of dextrose and also with epinephrine.

The temperature, pulse and respiratory rate (except for a rise of the temperature to 103 F. due to acute pyelitis on the seventh day in the hospital) remained either within normal limits or went up only slightly throughout the course.

The blood sugar readings continued to remain low on most occasions, and after several weeks greater amounts of sugar were needed for regaining of consciousness. It soon became necessary to give continuous intravenous injections of sugar to keep the patient from entering the unconscious state, during which she would perspire freely, have occasional twitchings of the face and convulsive movements of the arms and legs.

Treatment consisted chiefly of increasing the blood sugar by direct infusions of sugar or by stimulation of reserves of glycogen with epinephrine. Stimulation during the drowsy, stuporous periods was afforded by giving moderate doses of amphetamine sulfate. Large doses of theelin in oil were given during the course because of a possible beginning of the menopause. A series of ten 1 cc. ampules of adrenal cortex extract and a course of twelve ampules of a gonadotropic extract of the urine of pregnant women (antuitrin S) given intramuscularly were tried. Neither of these seemed to have any influence on the patient's condition.

On March 30, in spite of the continuous intravenous therapy including increased sugar and stimulants, the patient lapsed into coma and failed to be roused. She began having frequent convulsive attacks, an elevated temperature and an increased pulse rate and died at 5:30 a. m., March 31.

Autopsy.—This was performed four hours post mortem.

Interest in this case was focused on the liver and pancreas. The peritoneal cavity was normal aside from easily separated fibrous adhesions in the region of the gallbladder and adhesions between the omentum and epigastric operative incision. A nodular tumor 6 cm. in diameter replaced the head of the pancreas but did not involve the common bile duct. The tumor showed a firm, pale gray, opaque structure. Adjacent infiltrated retroperitoneal nodes measured from 1 to 2.5 cm. in diameter. The body and tail of the pancreas were normal. Microscopic examination of the tumor (fig. 1) revealed masses and tufts of small cells of uniform size and structure closely resembling those from the islands of Langerhans. These were located in

TABLE 3.—*Spinal Fluid Data*

3/2/40: Sugar, 74 mg. per 100 cc.; globulin, negative; 1 cell per c.mm.
3/6/40: Sugar, 71 mg. per 100 cc.; globulin, negative; 2 cells per c.mm.
3/4/40: Wassermann reaction negative
Colloidal gold curve negative
Pressure normal

cystlike spaces or scattered through fairly dense fibrous tissular stroma. The metastases to the lymph nodes were similar to the primary tumor.

The liver was enlarged (1,950 Gm.) with a nodular surface produced by numerous pale, slightly elevated and umbilicated nodules measuring up to 3 cm. Sections of the liver showed about half of its structure composed of these metastatic nodules. Microscopic examination (figs. 2 and 3) revealed the metastases as circumscribed masses of cells resembling islet cells within

cystlike spaces formed by surrounding hepatic cells. Fibrous stroma was slight. Other metastases were not found.

The adrenal glands were enlarged to a weight of 7 and 9 Gm. and measured 6.4 by 3.2 by 1.4 cm. and 3.5 by 4 by 1.4 cm.

The left lung weighed 600 Gm. and the right 550 Gm. The left portion of the thorax contained a small amount of serofibrinous exudate. Atelectatic areas were present in the lower lobes and areas of congestion and early nodular consolidation in the upper portions of the lower lobes of the lungs.

Other conditions were normal or nonpertinent. Examination included the heart, gastrointestinal tract, gallbladder, spleen,

TABLE 4.—*Excretion of Chlorides*

First 12 hour specimen, urinary chloride (as NaCl).....	1.5 Gm.
Second 12 hour specimen, urinary chloride.....	1.1 Gm.
Last 4 hour specimen, urinary chloride.....	0.22 Gm.

kidneys, uterus and adnexa and the brain. The spleen weighed 150 Gm. The brain weighed 1,265 Gm. and showed a slight cone of cerebellar pressure. The pituitary gland was grossly normal.

Anatomic diagnoses were islet carcinoma of the head of the pancreas with regional and hepatic metastases, pulmonary congestion and early congestive pneumonia, serofibrinous pleurisy on the left side and adrenal hyperplasia.

COMMENT

In our patient, hypoglycemia was extreme, mental changes were definite, and operation was impossible, but typical islet-like cells in the hepatic metastases were found at autopsy. An extract of these metastases was not made. However, since the tumor cells in the liver were younger and more rapidly growing than in the original tumor and since the metastases constituted nearly 50 per cent of the substance of the liver, it is reasonably safe to assume, especially in the light of the cases cited at the beginning of this paper, that the rapid increase in the severity of hypoglycemia toward the end was due largely to insulin produced and liberated by the metastatic island cells in the liver rather than by stimulation by the tumor of the normal island cells in the pancreas.

503 Delaware Avenue.

ANURIA FOR NINETY-SIX HOURS IN A TWO YEAR OLD INFANT FOLLOWING SULFAPYRIDINE THERAPY

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In the past eighteen months a number of reports have appeared in the literature regarding the possible renal complications of sulfapyridine therapy. By far the most serious of these is complete anuria with resultant uremia and death. Evidence has been presented by several authors to show that certain of the cases of anuria result from complete blockage of the lower part of the ureters by impacted crystals of acetylated sulfapyridine. In some instances relief has been obtained after cystoscopic manipulation and removal of the ureteral obstruction.

It is our purpose to offer additional evidence (1) that anuria following sulfapyridine therapy may be due to complete obstruction of the lower part of the ureters by sediment or crystals and (2) that cystoscopic investigation should be employed when such anuria occurs.

REPORT OF CASE

A boy aged 2 years became ill with cough, fever and chills on Dec. 8, 1940, and his family physician was called. The child was given 1 drachm (4 Gm.) of an alkaline preparation¹ every three hours for the next twenty-four hours, and fluids were forced. At that time a diagnosis of bronchopneumonia was made and sulfapyridine therapy was begun. Five-tenths Gm. was given immediately and was followed by 0.25 Gm. every

¹From the departments of Urology and Pediatrics of the Holt-Klock Clinic.

1. Citralka (Parke, Davis & Co.) was given, a preparation of citrates and tartrates of sodium and potassium together with salts of magnesium and calcium, 1 drachm (3.6 Gm.) of which has a systemic alkalinizing effect equivalent to approximately 1 Gm. of alkali.

four hours. After five doses had been taken the child began to vomit and could no longer retain the sulfapyridine. In all, 1.5 Gm. of sulfapyridine had been retained as well as more than 10 Gm. of alkali. The pneumonia was progressing favorably, however, and an uneventful recovery was expected. On December 12, the mother reported that the child's urine was reddish and small in amount. During that day voidings were scanty and slightly bloody, and the last urination occurred on the following morning, December 13. No urine was passed during the next forty-eight hours.

The child was admitted to Sparks Hospital on December 15 at 5 p. m. Physical examination revealed him to be well developed, well nourished and mentally clear and alert. His pupils reacted well to light and in accommodation and his ears were normal. There was some congestion of the nasal mucosa, and the tonsils were enlarged and hyperemic. The pharynx was slightly inflamed. The cardiac borders were within normal limits, the rate was regular and the quality was good. No murmurs were heard. The lungs were clear except for scattered crepitant rales. No areas of consolidation were found. No organs, masses or tenderness could be found in the abdomen. The extremities were normal. All reflexes were physiologic, and there was no evidence of subcutaneous edema.

Examination of the blood revealed 85 per cent hemoglobin with 4,500,000 red blood cells, and 17,200 white blood cells were present with 62 per cent small lymphocytes, 4 per cent mononuclears, 32 per cent neutrophils and 1 per cent basophils. No urine could be obtained for routine examination. The temperature was 100.6 F., the pulse rate 100 and the respiratory rate 28.

At the time of admission no history of anuria was obtained, and sulfapyridine therapy for pneumonia was promptly begun along with sodium bicarbonate in adequate amounts. No urine was obtained that day, and on further questioning of the mother it was learned that the child had been anuric at home. Medication was discontinued at once, but by this time the patient had received an additional 3 Gm. of sulfapyridine.

The child was then given 10 grains (0.6 Gm.) of sodium bicarbonate every three hours and 500 cc. of Hartmann's solution daily, and fluids were forced by mouth. The first 500 cc. of Hartmann's solution was given intravenously, but the child became progressively edematous and veins were not available. It was then given subcutaneously. During the next forty-eight hours the patient's condition became progressively worse. The child became lethargic and drowsy. Great irritability was demonstrated on any attempt to disturb him, and all the subcutaneous tissues were waterlogged. Until this time cystoscopic examination had been withheld. It was feared that a general anesthetic given to a patient with pneumonia might result in a fatal outcome. However, after ninety-six hours of complete anuria the child's chances appeared so slim that cystoscopic examination was undertaken—almost as a last resort.

This was performed on December 17 under nitrous oxide-ether anesthesia without any respiratory difficulty. A no. 14 Butterfield cystoscope was passed easily. There was no urine in the bladder. The trigone and vesical neck were moderately inflamed, and several yellowish white "flakes" were adherent to the mucosa. These appeared to dissolve immediately in water. Both orifices were slightly inflamed but otherwise normal. There was no efflux noted from either orifice. No. 4 catheters were passed 12 cm. up each ureter, meeting temporary obstruction at 2 cm. on the left and almost impassable obstruction at 5 cm. on the right. A "gritty" sensation was felt during the passage of the catheters. No flow came from either catheter, but after washing with sterile water a hydronephrotic drip appeared from both. The catheters were then aspirated and 36 cc. of urine removed from the left renal pelvis and 19 cc. from the right. Both urine specimens were dark and cloudy. Examination revealed a few epithelial cells, many red blood corpuscles and 5 to 6 leukocytes per high power field in the specimen from the right kidney. The specimen from the left kidney showed approximately the same condition. No organisms were found in either specimen. Both specimens were alkaline in reaction, and the sediment of each contained "amor-

phous amber granules in moss-like arrangement." Typical sheaves of acetyl sulfapyridine crystals could not be found.

A plain roentgenogram of the abdomen was taken, and no evidence was seen of opaque calculi. Pyelograms were not made.

The catheters were left in place, and the patient was returned to his room. The catheters remained in place fourteen hours before slipping out, and during that time 1,225 cc. of urine was collected. In addition, the child voided in bed five times, and no record of the amount could be obtained. However, it seems clear that at least 2,000 cc. of urine was secreted during the twenty-four hours following cystoscopic examination.

During the next three days a moderate flare-up of the thoracic condition occurred, which undoubtedly was the result of the general anesthetic. It soon subsided, however, and during this time the child continued to void frequently and in large amounts. By the third day after employment of the cystoscope the subcutaneous edema had completely disappeared. At this time (December 30) examination of the blood revealed a nonprotein nitrogen level of 30.6 mg. per hundred cubic centimeters, and urinalysis was negative except for a trace of albumin, an occasional hyaline cast and 2 to 4 leukocytes per high power field.

The patient's convalescence was uneventful and he was discharged on December 24, a urinalysis the day before being completely negative.

COMMENT

There seems little doubt that this case of anuria resulted from obstruction in the lower part of the ureters. We feel that the obstructing concretions in all probability were composed of acetylated sulfapyridine. It is unfortunate that the typical sheaves of acetyl sulfapyridine crystals could not be demonstrated, but it is our feeling that this case agrees in every detail with those previously reported in which typical crystals were found.

It is interesting to note that this patient received adequate amounts of alkali throughout the course of the sulfapyridine therapy. Also to be observed is the fact that the urine aspirated from each renal pelvis at cystoscopic examination was alkaline. This merely reemphasizes the fact that little is known yet concerning the conditions under which sulfapyridine concretions are formed. The mere alkalization of the urine by means of large doses of sodium bicarbonate or similar drugs is not in itself a protection against the precipitation of concretions.

Not all patients displaying the symptom complex of pain in the loins and hematuria demand cystoscopic manipulation. Numerous patients have recovered from this complication without any therapy other than discontinuance of sulfapyridine and the forcing of fluids. It must be emphasized, however, that in these instances the concretions were situated in one or both renal pelves and were not in a position to block the urinary tract. After a few days these concretions dissolved in their alkaline surroundings, and the urinary symptoms disappeared. The case reported presented a more serious complication and demanded manipulation of the patient with a cystoscope. It corresponded closely to that reported by Tsao and his associates² in their case a child died because crystalline concretions formed at the ureterovesical orifices and completely blocked the ureters, resulting in anuria. We feel that our more fortunate experience resulted from the cystoscopic dislodgment of impacted crystals in the lower portion of the ureters with resultant reestablishment of urinary drainage.

SUMMARY

1. Complete anuria for ninety-six hours occurred during sulfapyridine therapy for pneumonia in an infant aged 2.
2. The anuria appeared to be the result of complete obstruction to the lower portion of both ureters.
3. Treatment with a cystoscope produced relief of the condition, probably by means of dislodgment of concretions impacted in the lower part of the ureters.

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2. Tsao, Y. F.; McCracken, Mary E.; Chen, Ji; Kuo, P. T., et al. *Dale, C. L.: Renal Complications in Sulfapyridine Therapy, J. A. M. A. 113: 1316 (Sept. 30) 1939.*

Special Article

GLANDULAR PHYSIOLOGY AND THERAPY

GROWTH HORMONE OF THE ANTERIOR LOBE OF THE PITUITARY GLAND

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This special article is published under the auspices of the Council on Pharmacy and Chemistry. It is one of a series which will be published in book form as the second edition of "Glandular Physiology and Therapy." The opinions expressed in this article are those of the author and do not necessarily represent the views of the Council.—Ed.

INTRODUCTION

Nutritional studies in the domain of the vitamins have long since shown the fallacy of designating any one of these factors as peculiarly growth promoting; as a matter of fact, growth cannot ensue with all of these factors present in a diet which is inadequate for proper nutrition. Just as normal growth is dependent on a multiplicity of these extrinsic factors, so also the same may be said as to intrinsic factors, for more than one of the glands of internal secretion can be shown to have very definite relations with growth. When the thyroid, for example, is removed from a young mammal, growth is always impaired; growth ceases abruptly after hypophysectomy. In the last-mentioned instance, the claim that the cessation of growth has resulted from the removal of a pituitary hormone essential for growth has only gradually gained validation.

As regards the nutritive, or extrinsic, factors influencing growth, the observation that there is, in fact, a lowered intake of necessary food ingredients in hypophysectomized animals may be paralleled with the observation that starvation of normal animals causes regressive changes in the gonads and thyroids resembling those produced by hypophysectomy.¹

As regards the intrinsic factors essential for growth, it is, of course, conceivable that the stasis of growth after hypophysectomy is only secondarily due to the loss of the hypophysis, that primarily it is due to subnormality of one or more of the endocrine organs—the target organs—known to be directed by the pituitary. The production of excessive growth, or gigantism, by overconveyance of hypophysial hormones could be similarly explained as due to the administration of excessive amounts of the pituitary substances which affect certain target organs.

Fortunately it is possible to utilize crucial tests of the validity or invalidity of these explanations as to how the hypophysis regulates growth.

1. One can attempt to produce a restoration of growth in hypophysectomized animals or an overgrowth

of normal animals by direct conveyance of one or more of the different principles secreted by the target organs, e. g., thyroxin, extract of adrenal cortex, sex steroids, insulin and others; or

2. One can attempt to bring about a restoration of growth in hypophysectomized animals or an overgrowth of normal animals by administering one or more of the special anterior pituitary principles affecting the target organs, e. g., extracts containing, respectively, the thyrotropic, lactogenic, adrenocorticotropic and gonadotropic factors; or

3. One can attempt to produce a typical restoration of growth in hypophysectomized animals or an overgrowth of normal animals with anterior pituitary extracts devoid of the four just mentioned factors that influence target organs or containing inconsequential amounts of them.

Much effort has been expended on such experiments.² The outcome indicates that growth-stimulating anterior pituitary extracts do not attain their result by virtue of their content of the four well known principles affecting target organs. The growth hormone is hence clearly separate from the target organ hormones.³ An equally decisive answer cannot be given as to whether the promotion of growth by anterior pituitary extracts is due to one or more of the incompletely separated metabolic "hormones" of the anterior lobe, i. e., the ketogenic, glycotropic, glycostatic, contrainsular, diabetogenic, pancreatropic, nitrogen-retaining and other factors.

It will be the task of future research to investigate the metabolic effects of highly purified preparations containing the growth factors, but the results of such inquiries—whatever they may be—cannot be expected to invalidate the appropriateness of the term "growth hormone," a designation founded on the most obvious and remarkable effect of this substance—increase in body size. The inquiries in question may be expected, on the other hand, to elucidate the method of action of the growth hormone—a subject on which investigators are totally uninformed—and may hence contribute significantly to understanding of the biochemical mechanism of growth.

BIOASSAY

Efforts to purify extracts of the growth-promoting factor have hitherto employed almost exclusively the simple test of increase in the total body weight of the normal or the hypophysectomized animal (rat) during a stated interval of time. The Laqueur school has recently suggested certain features of skeletal growth as criteria for the potency of such extracts.

The tests employing gains in body weight, though abbreviated by many investigators, are time consuming for high accuracy unless considerable numbers of animals are employed for each dose level of each

From the Institute of Experimental Biology, University of California. The publication of the above article was unavoidably delayed and is therefore not in its proper sequence in the series of articles for the second edition of *Glandular Physiology and Therapy*. It will appear under the section heading of Anterior Pituitary Gland in the bound volume.—Ed.

1. Neither quantitative nor qualitative undernutrition has as yet been shown to produce the distinctive picture of hypophysectomy. The conveyance of the hypophysial growth hormone invariably increases food consumption, but no increase in the inflow of nutritive elements has as yet been shown to imitate the distinctive effects of the conveyance of the hypophysial growth hormone. M. O. Lee (Relation of the Anterior Pituitary Growth Hormone to Protein Metabolism, *A. Research. Nerv. & Ment. Dis., Proc.* (1936) 17:193-222, 1938) was the first to show that these effects can be detected in growth hormone-treated animals restricted to the same nutritive intake as untreated controls.

2. (a) Evans, H. M.: The Hypophysial Growth Hormone: Its Separation from the Hormones Stimulating the Thyroid, Gonads, Adrenal Cortex and Mammary Glands, *A. Research. Nerv. & Ment. Dis. Proc.* (1936) 17:175-192, 1938. (b) Evans, H. M.; Simpson, M. E., and Pencharz, R. I.: Relation Between the Growth Promoting Effects of the Pituitary and the Thyroid Hormone, *Endocrinology* 25:175-182, 1939.

3. Much confusion was introduced by the Riddle school (Bates, R. W., Laanes, T., and Riddle, O.: Evidence from Dwarf Mice Against the Individuality of Growth Hormone, *Proc. Soc. Exper. Biol. & Med.* 33:446-450, 1935. Schooley, J. P.; Riddle, O., and Bates, R. W.: Analysis of Pituitary Support of Growth of Body and Viscera in Pigeons, *Anat. Rec.* 72 [suppl.1:90, 1938]) by the erroneous claim that this was not the case—a claim based on the promotion of growth in silver dwarf mice by a thyrotropic extract and in hypophysectomized pigeons by a lactogenic extract of the anterior lobe. The last-mentioned accomplishment has been repeatedly confirmed in this laboratory by the employment of a highly purified lactogenic extract, but no significant growth of hypophysectomized mammals is caused by this purified mammotropin at corresponding dose levels, whereas growth factor preparations devoid of lactogenic effects always promote marked growth of the hypophysectomized mammal at very much lower dose levels.

preparation. These difficulties have been somewhat lessened by the recent establishment of accurate graphs of the growth response.

Normal Versus Hypophysectomized Animals.—The young hypophysectomized rat has hitherto and correctly been regarded as the crucial test object for growth hormone research. It may, however, be allowable to point out that hypophysectomized animals suffer from many deficiencies. As was determined in the inception of growth hormone research, normal animals may be used for accurate tests of growth factor potency, provided female rats 5 months of age or older are employed. Such animals exhibit a "plateau of growth" but can be induced to grow rapidly by appropriate growth factor dosage. They are more resistant to the toxic effect of crude extracts and in general are harder than hypophysectomized animals but are notably less sensitive than the latter to low dosage with the growth principle, as table 1 shows.

TABLE 1.—Comparison of the Body Weight Increase of Normal "Plateaued" and of Hypophysectomized Female Rats Treated with Anterior Pituitary Growth-Promoting Substance ("Globulin" Fraction) for Ten Days

Test Group	Animals	Daily Dose, Mg.	Weight Increase per Day, Gm.
Normal.....	63	1.0	2.93
Hypophysectomized.....	50	0.1	1.36

TABLE 2.—Average Responses of Hypophysectomized Rats of Different Ages and Weights to an Anterior Pituitary Growth-Promoting Extract Given in Doses Proportional to Body Weight

Experi- ment	Rats	Age, Days		Body Weight at Onset of Experi- ment	Daily Dose, Mg.	Gain in Body Weight in 20 Days	
		At Opera- tion	At Onset of Experi- ment			Gm.	Per- centage
I	12	28	56	72.8	0.100	29.4	40.4
	10	50-62	85-89	140.5	0.193	34.3	24.4
	11	29-30	52	78.5	0.090	26.8	34.1
II	12	62-63	82-83	143.3	0.164	22.3	15.6

Normal animals have the great advantage of possessing a hypophysis and hence possessing numerous hypophysial hormones—doubtless, some unknown—the absence of which in the hypophysectomized animal may possibly militate against the success of growth factor preparations as purification of these proceeds.

When hypophysectomized rats are given injections of growth-promoting extracts, males and females respond alike.⁴ Advantage attaches to the choice of very young animals and to the allowance of a sufficient postoperative interval to establish that the operation has been complete—a fact disclosed by stasis of growth. For example, females 26 to 30 days old are hypophysectomized and an eight to ten day interval is allowed to elapse before injections of the growth-promoting extract are begun. Only those animals are employed for the test in which a gain of less than 6 Gm. in total body weight has ensued.⁵ Greater increase in body weight is caused by the same dosage when the

administration of the growth factor preparation is begun on the day of hypophysectomy.

Standard Growth Response Graphs.—It is now generally agreed that if a growth factor extract is given at various dose levels to groups of standardized animals, a straight line relationship exists between the logarithm of the dose level and the response in body weight.⁶ The responses of normal "plateaued" female rats to growth factor preparations of differing potencies (A, B, C, D) have been charted in this way, and the resulting lines, representing the relation between the logarithm of the dose and the growth resulting, are approximately parallel (chart). When the dose levels are computed in "units" instead of milligrams of substance, the parallel lines coincide.⁷ (The normal rat unit has been arbitrarily defined as the amount of any preparation that confers a gain of 40 Gm. in total body weight in a twenty-day period, seventeen injections, and the hypophysectomized rat unit, as that amount which confers a 10 Gm. gain in ten days, nine injections; the amount of substance required for unit response in the latter case is approximately one tenth that required in the former.) The straight line relationship between the response and the logarithm of the dose is valid only for a limited range of dose levels. This is true for hypophysectomized as well as for normal rats. The optimum range of responsiveness in body weight gain for the hypophysectomized animals is between 10 and 20 Gm. in ten days; that for normal rats is between 20 and 60 Gm. in twenty days.

Different periods of time have been proposed for these assays by different workers. Daily injections are given for periods ranging from three to twenty days. But when one studies the relationship between the logarithm of the dose and the response for a given preparation for periods ranging from five to twenty days, it becomes evident that the slope of the line increases with the period of time of the injections, at least up to fifteen days. Since the accuracy of the method will be the higher the steeper the slope of the curve, the advantage of using a fifteen day test as contrasted with shorter tests is obvious.

It has been suggested that it would be preferable to compute the body weight gain in per cent of body weight and, also, to administer the preparation in strict proportion to body weight.⁸ If marked variations in body weight are encountered within experimental groups of rats of the same age, this might well be advisable. It is more important, however, to standardize both the age and body weight of experimental animals. That standardization of age is of primary importance is shown in table 2, from which it is evident that if rats are hypophysectomized at different ages, thus having different body weights, and are given injections, after the same postoperative periods, of doses proportional to their body weights, their gain is not the same even when computed as per cent of body weight, for the younger animals are more responsive.

4. Chou, C.; Chang, C.; Chen, G., and Van Dyke, H. B.: Observations on the Quantitative Assay of Growth-Promoting Extract of the Hypophysis, *Endocrinology* 22: 322-334, 1938.

5. Under such circumstances the nose-anus dimension has usually remained constant, although an increase of 1 cm. in the anus-tail tip measurement is regular; the latter measurement may increase by 2 cm. in twenty days in young completely hypophysectomized females but is then at stasis.

6. (a) Bülbring, E.: The Estimation of the Growth Hormone of the Anterior Lobe of the Pituitary Body, *Quart. J. Pharm. & Pharmacol.* 11: 26-33, 1938. (b) Evans, H. M.; Uyei, N.; Bartz, Q. R., and Simpson, M. E.: The Purification of the Anterior Pituitary Growth Hormone by Fractionation with Ammonium Sulfate, *Endocrinology* 22: 483-492, 1938. (c) Fraenkel-Conrat, H. L.; Meamber, D. L.; Simpson, M. E. and Evans, H. M.: Further Purification of the Growth Hormone of the Anterior Pituitary, *ibid.* 27: 605-613, 1940. (d) Fevold, H. L.; Lee, M.; Hisaw, F. L., and Cohn, E. J.: Studies in the Physical Chemistry of the Anterior Pituitary Hormones, *ibid.* 26: 999-1004, 1940. (e) Light, A. E.; de Beer, E. J., and Cook, C. A.: Biological Assay of Anterior Pituitary Growth Hormone, *Proc. Soc. Exper. Biol. & Med.* 44: 192-196, 1940. (f) Chou and co-workers.⁴

7. With W. Marx and M. E. Simpson I am preparing a paper on standardization of extracts containing the growth factor.

8. Chou and co-workers.⁴ Light and co-workers.⁶

Seasonal and Unaccountable Variations.—Every laboratory conducting routine growth factor tests has encountered annoying variations in the response of animals to a standard preparation at various times of year. In order to meet this difficulty, Light and co-workers^{6c} stressed the importance of a standard reference preparation.

Skeletal Changes Due to the Growth Hormone.—It has been proposed by Freud and co-workers⁹ that the increase in tail length rather than in body weight of hypophysectomized rats be used as the test for the effect of the growth extract. These investigators believe this to be a more specific and, thus, more reliable criterion for the effect of the growth-promoting substance. The method may possess advantages due to its specificity, but these are offset by the following considerations: Young untreated control animals show some continued tail growth for the first few weeks after complete hypophysectomy, and the additional effects produced by injections of the growth-promoting substance in a short test interval are not sufficiently great. Furthermore, the percental error of measurement is larger for the tail length increase than for the body weight gain. There is even some question as to whether the purified extract reported by Freud and collaborators to maintain normal growth in the tail is identical with the growth-promoting factor since it apparently had little or no effect on body weight in the treated animals as compared with untreated controls. The question demands further research.

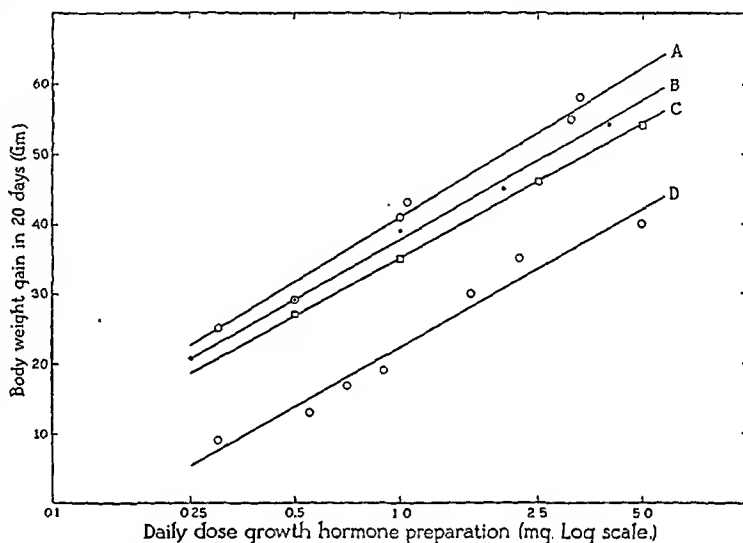
A more important proposal by the Amsterdam school relates to the proliferation of the cartilage of the epiphyseal disk. This effect of the hormone is definite and easily demonstrable.¹⁰ In hypophysectomized animals indubitable effects of the growth substance can be seen after three daily injections.¹¹ It must be emphasized that while the growth factor is chondrotropic, its effects are registered not solely by the proliferation of epiphyseal cartilage cells but by the stimulus to all the normal processes of osteogenesis at the epiphyseal-diaphyseal junction.¹²

Conditions Necessary for the Continued Growth of Hypophysectomized Animals.—It has been repeatedly observed that hypophysectomized rats will at first respond maximally to partially purified preparations of the growth principle but will subsequently show less response or indeed exhibit growth stasis. Fortunately, the lessened response seldom or never occurs during the typical test period (ten to fifteen days), so that efforts to purify the preparation are not thereby impeded. It is improbable that the lessened response is associated with the development of an antigrowth substance, for potent crude extracts would be more prone to cause the development of antisubstances, and yet they permit continued and eventually gigantic growth of hypophysectomized animals. It is probable

that hypophysectomized animals eventually need for growth more of their hypophysial hormones than the particular one—the growth hormone. This concept is supported by the fact that normal rats continue to grow for long periods when given injections of partially purified preparations that fail to give continuous growth in hypophysectomized rats. It remains for future research to disclose the identity of these cooperating hypophysial hormones, but the indications of their indispensability cannot invalidate the concept of the growth hormone itself.

PRESENT STATE OF PURITY AND CHARACTERISTICS OF GROWTH PROMOTING PREPARATIONS

Growth promoting preparations are at present generally made from fresh or acetone-desiccated anterior pituitary tissue by preliminary aqueous alkaline extraction followed by fractionation with ammonium sulfate.^{6b,d} The precipitate formed at 0.4 saturation with ammonium sulfate is designated the globulin fraction. This fraction may be further purified by isoelectric



Standard growth response curves; pituitary preparations of different growth-promoting potencies injected into normal "plateaued" female rats.

precipitation. Such a product is still contaminated with the adrenocorticotrophic and lactogenic factors and with smaller amounts of the thyrotrophic and interstitial cell-stimulating factors. The latter three contaminants can be removed by cysteine treatment of the globulin fraction.^{6c} These preparations contain 20 to 100 hypophysectomized rat units per milligram, the daily dose required for a daily gain of 1 Gm. in body weight (1 unit) varying from 10 to 50 micrograms. The Laqueur school¹³ has employed different methods—adsorption on norite (a specially activated plant charcoal) and elution with phenol. Their methods have not yet been given complete publication. Although purified, the best growth promoting preparations cannot yet lay claim to being single homogeneous substances. The enumeration of chemical characteristics must be taken as applicable only to impure preparations. The analysis for nitrogen content, together with other analyses, indicates that one is dealing with a protein or a mixture of proteins.

The growth-promoting potency of preparations is greatly reduced or destroyed by boiling, and partial

9. Freud, J., and Levie, L. H.: Hypophyse und Schwanzwachstum der Ratte. Ein Test für Wachstumshormon. *Arch. internat. de pharmacodyn. et de therap.* 59: 232-242, 1938. Freud, J.; Levie, L. H., and Kroon, D. B.: Observations on Growth (Chondrotrophic) Hormone and Localization of Its Point of Attack. *J. Endocrinol.* 1: 56-64, 1939.

10. Ray, R. D.; Evans, H. M., and Becks, H.: Effect of the Pituitary Growth Hormone on the Epiphyseal Disc of the Tibia of the Rat. *Am. J. Pathol.*, to be published.

11. Kibrick, E.; Becks, H., and Evans, H. M.: Article in preparation.

12. Ross, E. S., and McLean, F. C.: The Influence of the Growth Promoting Hormone of the Anterior Lobe of the Pituitary upon Growth Activity in the Long Bones of the Rat. *Endocrinology* 27: 329-339, 1940.

13. Dingemans, E., and Freud, J.: Purified Growth Hormone from Beef Anterior Pituitary. *Acta brev. Neerland.* 5: 39 and 109, 1935.

destruction of potency occurs on subjection to temperatures above room temperature for several hours. Relatively crude preparations are stable in the cold in alkaline solutions up to p_H 11.0 but less stable or destroyed in acid solutions below p_H 4.0. The potency is reduced by the action of strong oxidizing agents, such as hydrogen dioxide (H_2O_2), but is more stable in the presence of reducing agents, such as cysteine, ascorbic acid and glutathione. Ninety-six per cent acetic acid, 90 per cent phenol and 50 per cent urea dissolve the substance and do not very appreciably reduce its potency within an hour or two.

METABOLIC EFFECTS OF GROWTH HORMONE

Among the earliest noted effects of the growth factor on metabolism was the action on protein or nitrogen metabolism, namely, the decrease of the nonprotein nitrogen and amino acid nitrogen of the blood and of urinary total nitrogen.¹⁴ Consequently, the hormone has been considered by some as gaining its effects primarily "by increasing the amount of nitrogenous material available for cell growth and multiplication."^{14b}

Reiss, Schwarz and Fleischmann¹⁵ have reported that in dogs and rabbits after injections of "growth hormone" the blood urea was increased while at the same time the blood nonprotein nitrogen and blood arginine dropped from 10 to 50 per cent. They made the interesting but inadequately founded suggestion that the hormone is effective by activating arginase in the tissues. Mirsky and Swadesh¹⁶ and Mirsky¹⁷ suggested two distinct effects of anterior lobe extracts on protein metabolism, a direct one on protein catabolism in the muscles and an indirect one through the pancreas, stimulating protein anabolism, and that the stimulation of growth depends on this pancreatropic effect.

The relations of anterior lobe factors to carbohydrate metabolism (not here discussed) represent a field which is far from complete elucidation, but it may be noted that Shipley and Long¹⁸ have felt it not unlikely that the ketogenic, diabetogenic and growth-promoting hormones are identical. Greaves and co-workers,¹⁹ who partially purified preparations of the respiratory quotient-reducing and ketogenic factors, suggested that these are related to the growth hormone, since in their procedures of purification the potencies of the three principles ran parallel. The complexities of the situation may be further illustrated by the fact that Marks and

Young²⁰ have recently shown that certain anterior lobe extracts increased the insulin content of the pancreas of the rat to almost twice normal values. In ammonium sulfate fractionation of these extracts the insulin-increasing (pancreatropic) substance accompanied the diabetogenic and growth-promoting factors, but the investigators did not consider it to be identical with either of these substances, for extracts could be made from commercial dried anterior lobe powder which had insulin-increasing but not diabetogenic or growth-promoting properties. Nor did they feel that diabetogenic and growth-promoting hormones were identical, for "stale" crude extracts of fresh anterior lobe tissue were not diabetogenic though growth promoting and insulin increasing.

It should be stressed that the studies of the metabolic effects of growth hormone have hitherto been performed with relatively crude preparations. The study of the metabolic effects of highly purified growth hormone preparations is urgently demanded and will occupy the attention of the immediate future.

RELATION OF ANTERIOR PITUITARY GROWTH HORMONE TO OTHER HORMONES

A functional thyroid gland, or the presence of its products, is clearly important in the regulation of growth. Young thyroidectomized animals cannot undertake normal growth, evidently because of impairment of the hypophysis, which exhibits no eosinophilic elements and presumably does not secrete growth hormone. Normal or better than normal growth is conferred on such animals by the injection of an extract containing the growth factor. Conversely, thyroxin improves the growth secured with standardized preparations of the growth substance.²¹

Inhibition of growth results from administration of estrone (theelin) in high doses,²² which may be assumed to divert the pituitary gland from the secretion of growth hormone, although the consequent pituitary hypertrophy indicates the assumption of other activities on the part of the gland. Testosterone in high doses also inhibits growth but in low doses may be stimulating to the pituitary and secondarily to growth.²³ The smaller size of the female among mammalia may be related to the inhibition of growth by estrone and the greater size of the male to the stimulation of growth by testosterone.

Both adrenocorticotrophic hormone and some of the cortical principles of the adrenal gland when given in high doses inhibit somatic growth in young rats.

Thymus extracts have been claimed to stimulate growth, though this has not been adequately confirmed. Certain it is that thymic hypertrophy is always seen in animals which have responded to growth promoting extracts, which may hence be said to be "thymotropic."²⁴ Yet as Reinhardt and co-workers²⁵ have

14. (a) Teel, H. M., and Watkins, O.: The Effect of Extracts Containing the Growth Principle of the Anterior Hypophysis upon the Blood Chemistry of Dogs, *Am. J. Physiol.* **89**: 662-685, 1929. (b) Teel, H. M., and Cushing, H.: Studies in the Physiological Properties of the Growth-Promoting Extracts of the Anterior Hypophysis, *Endocrinology* **14**: 157-163, 1930. (c) Gaebler, O. H.: Some Effects of Anterior Pituitary Extracts on Nitrogen Metabolism, *J. Exper. Med.* **57**: 349, 1933. (d) Lee, M. O., and Schaffer, N. K.: Anterior Pituitary Growth Hormone and the Composition of Growth, *J. Nutrition* **7**: 337-363, 1934. (e) Gaebler, O. H.: Effects of Thyroparathyroidectomy and Carbohydrate Intake on the Action of Anterior Pituitary Extracts, *Am. J. Physiol.* **110**: 584-592, 1935. (f) Eyres, G. B., and Lee, M.: Determination of the Nitrogen Partition in Tissues, *J. Biol. Chem.* **115**: 139-148, 1936. (g) Howes, N. H.: Anterior Pituitary and Growth in the Axolotl (*Ambystoma Tigrinum* [Green] Neotenic Form): II. The Effect of Injection of Growth-Promoting Extracts upon the Utilization of Food, *J. Exper. Biol.* **15**: 447-452, 1938. (h) Lee.³

15. Reiss, M.; Schwarz, L., and Fleischmann, F.: Beiträge zur Beziehung zwischen Hypophysenvorderlappenhormonwachstumshormon und Eiweissstoffwechsel, *Endokrinologie* **17**: 167-170, 1936.

16. Mirsky, A., and Swadesh, S.: The Influence of Anterior Pituitary Gland on Protein Metabolism, *Endocrinology* **25**: 52-56, 1939.

17. Mirsky, A.: The Influence of the Anterior Pituitary Gland on Protein Metabolism, *Endocrinology* **25**: 52-56, 1939.

18. Shipley, R. A., and Long, C. N. II.: Studies on the Ketogenic Activity of the Anterior Pituitary: I. The Relation of Ketonaemia to Ketouria in the Rat; II. A Method for the Assay of the Ketogenic Activity; III. The Nature of the Ketogenic Principle, *Biochem. J.* **32**: 2342-2356, 1938.

19. Greaves, J. D.; Freiberg, I. K., and Johns, H. E.: Preparation and Assay of Anterior Pituitary Fractions Rich in Ketogenic and Respiratory Quotient-Reducing Substances, *J. Biol. Chem.* **133**: 243-259, 1940.

20. Marks, H. P., and Young, F. G.: The Hypophysis and Pancreatic Insulin, *Lancet* **1**: 493-497, 1940.

21. Smith, P. E.: Increased Skeletal Effects in A. P. Growth-Hormone Injections by Administration of Thyroid in Hypophysectomized, Thyroparathyroidectomized Rats, *Proc. Soc. Exper. Biol. & Med.* **30**: 1252-1254, 1933. Evans and co-workers.²¹

22. Zondek, B.: The Inhibitory Effect of Follicular Hormone on the Anterior Lobe of the Pituitary Gland, *Lancet* **1**: 10-12, 1936; Impairment of Anterior Pituitary Functions by Follicular Hormone, *Ibid.* **2**: 842-847, 1936.

23. McEuen, C. S.; Selye, H., and Collip, J. B.: Effect of Testosterone on Somatic Growth, *Proc. Soc. Exper. Biol. & Med.* **26**: 399-394, 1937.

24. Uylfert, I. E., and Freud, J.: Thymus Weight of Normal and Hypophysectomized Rats and the Influence of Anterior Pituitary Extracts, *Acta brev. Neerland.* **5**: 188-190, 1938.

25. Reinhardt, W. O.; Marx, W., and Evans, H. M.: Effect of Anterior Pituitary Growth Hormone on the Thymectomized Rat, *Proc. Soc. Exper. Biol. & Med.* **46**: 411-415, 1941.

recently shown, the thymus gland is not necessary for the action of the growth hormone.

CLINICAL EMPLOYMENT OF EXTRACTS CONTAINING THE GROWTH-PROMOTING SUBSTANCE

The therapy of uncomplicated dwarfism in children will undoubtedly be greatly aided by purification of extracts containing the growth-promoting substance. In some instances crude extracts have been recommended, through belief that long-continued response is more apt to occur with them than with highly purified preparations, but the disadvantages of crude extracts are manifold. The quantities injected must be large, and undesirable consequences may ensue, such as gonadotropic and diabetogenic effects. The extracts already available have demonstrated that dwarfed children can in some cases be made to resume a growth as rapid as that characterizing the earliest epochs of childhood, and a considerable number of such children have now been treated for their dwarfism with partial or complete success.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

VAPOR-ALL VAPORIZERS, MODELS EV8 AND EV14 ACCEPTABLE

Manufacturer: The Kitchen Katch-All Corporation, Greenwich, Ohio.

The Vapor-All Vaporizers, Models EV8 and EV14, are designed to be used as inhalator-humidifiers. Heating elements incorporated in the units operate on alternating current, 115 volts, and are provided with thermostats for controlling the current, which will be automatically turned off if the water container has boiled dry. The water level is visible through a glass container. Directional vapor tubes, bottles, medicine cup, clamps, carrying-handles and cords are supplied with the devices, which have polished copper boilers trimmed with aluminum.

Vaporizer Model EV8 will operate for six hours without interruption and the EV14 for ten hours. A fountain feed supplies a flow of water to the heater, and medicated inhalations are provided for by use of a separate medicine chamber..

The Council voted to accept the Vapor-All Vaporizers, Models EV8 and EV14, for inclusion on its list of accepted devices.

DRIFLASH ELECTROSURGICAL UNIT
MODEL C-101, BIPOLAR,
ACCEPTABLE

Manufacturer: General Automatic Corporation, Macedonia, Ohio.

The Driflash Electrosurgical Unit, Model C-101 for bipolar use, is designed for all types of minor surgery involving electro-coagulation within the power limits of the device. The firm states that the technic used is known as biterminal coagulation, where coagulation occurs only in the small area between the two active electrodes. The unit, which is similar in appearance to the Council accepted Model C-100 Driflash for monopolar

technic, is housed in a molded plastic case with a hanger so that it may be hung on the wall. A foot switch operates the unit, and a pilot light indicates when it is energized.



Driflash Electrosurgical Unit, Model C-101, Bipolar.

In investigating the device clinically the Council found that, when small lesions of the skin are treated with the monopolar current and that when use of the bipolar coagulating current is limited to similar small areas such as hemorrhoids and tonsils and the areas of these further limited to the width of the electrode, the device will give satisfactory service. The monopolar current is a true desiccating current, and the coagulating current is satisfactory when limited to the area of the electrodes supplied with the apparatus.

The Council on Physical Therapy voted to accept the Driflash Electrosurgical Unit, Model C-101 for bipolar use, for inclusion on its list of accepted devices.

RADIO-EAR ELECTRONIC 41 HEARING AID ACCEPTABLE

Manufacturer: E. A. Myers and Sons, Inc., 306-308 Beverly Road, Mount Lebanon, Pittsburgh.

The Radio-Ear Electronic 41 Hearing Aid is a vacuum tube instrument and consists of the following parts:

- (a) Combined microphone and vacuum tube unit M-5430 with volume control switch and battery "economizer." This combination is 3¼ by 1¾ by ¾ inches and weighs 83 Gm.
- (b) The A battery is a special Radio-Ear 728, 1.5 volts cell, 1 inch in diameter by 3¾ inches long. The B battery, Radio-Ear 729 is 4½ by 1¾ by 1 inches. The combined weight of batteries is 308 Gm. Connections are made by means of a special three prong plug connector.
- (c) Midget receiver R-3922, ¼ by 1½ inches, weighing with earpiece 11.0 Gm. Bone conduction receiver B-2046, 1¾ by ¾ by ¾ inches weighing 22 Gm.

The Council's investigation of the device reveals that:

Battery Drain.—With new batteries giving full voltage, the current drains are as shown in table 1.

TABLE 1.—Current Drains at Full Voltage

Battery	Economizer Position	Voltage	Current
A.....	Battery used	1.5	100.00 ma.
B.....	Battery used	34.5	1.70 ma.
A.....	Battery new	1.5	85.00 ma.
B.....	Battery new	34.5	1.55 ma.

TABLE 2.—Sound Intensity Amplification

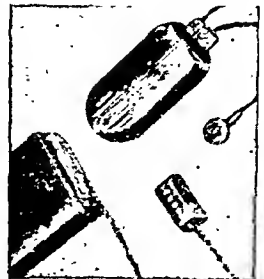
	128	256	512	1,024	2,048	4,096
At normal ear threshold....	?	22	27	40	40	22
At approximately 45 decibels above normal threshold...	?	8	22	40	44	5

Mechanical Features.—The instrument is neat in appearance and the parts are substantially made. With close fitting of the earpiece, the instrument is stable and without "feedback squeals" with volume control set as high as seven eighths of full volume.

Performance tests were made with the economizer set in the "used battery" position and with the tone control set on the white dot.

Amplification.—The instrument showed the over-all sound intensity amplification given in table 2.

The Council voted to accept the Radio-Ear Electronic 41 Hearing Aid for inclusion on its list of accepted devices.



Radio-Ear Electronic 41 Hearing Aid.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JULY 26, 1941

THE VALUE OF RESPIRATORS IN POLIOMYELITIS

At least six hundred and eighty mechanical respirators are available in the United States. An estimate of their value in poliomyelitis, subject to the limitations of the questionnaire method, was obtained by Wilson¹ for the National Foundation for Infantile Paralysis. Replies to the questionnaire were received concerning four hundred and twenty of the respirators owned by three hundred and thirty-five hospitals, other institutions or individuals. The purposes of the survey were (1) to determine the total number of patients with poliomyelitis treated by means of respirators in the year 1940, (2) to determine to what use available respirators have been put, (3) to obtain some idea of the use of the respirators for patients other than those with poliomyelitis and (4) to attempt to evaluate the accuracy of diagnosis and of judgment shown in selecting the right type of patient to be placed in a respirator.

Of the three hundred and thirty-five returns, one hundred and thirty-two reported having had patients with poliomyelitis treated in respirators, with a total of 331 patients. Wilson believes that between 400 and 500 patients with poliomyelitis were treated in respirators in the United States during 1940. In addition to the 331 patients with poliomyelitis who were treated, 136 patients with other diseases were placed in respirators. Twenty-nine per cent of the victims of poliomyelitis were under 10 years of age, 41 per cent between 10 and 20 years of age and 30 per cent over 20 years. Only 52 per cent of patients with poliomyelitis were placed in respirators on the fourth day of the disease or earlier, whereas 25 per cent were put in the respirator on the seventh day of their disease or later. Apparently there is a surprisingly high incidence of respirator patients in the older age groups and a large percentage of patients not treated with respirators until comparatively late. Possibly a considerable number of these patients were neglected and should have had respirator treatment earlier.

Of the total number of patients with poliomyelitis reported, over 60 per cent (204 patients) were stated to have the "bulbar" form of the disease or it was indicated that they had difficulty in swallowing. Many of these patients probably should not have been put in respirators, but this cannot be definitely stated because the bulbar symptoms, which cannot be helped by respirators, may have been associated with paralysis of the respiratory muscles, which can be so helped. Of the 204 patients stated to have the "bulbar" form of the disease or indicated as having difficulty in swallowing, all but 17 were reported as having intercostal or intercostal and diaphragmatic paralysis. Patients who have trouble with swallowing often breathe irregularly and shallowly and act as if they have intercostal paralysis when actually they do not. Hence many of these cases were no doubt inaccurately diagnosed. Twelve patients were reported as having difficulty in swallowing but were not stated to have the "bulbar" form of the disease; these were wrongly diagnosed. Twenty-eight were stated to have the "bulbar" form without difficulty in swallowing being noted; all of these but 8 were recorded as having intercostal or diaphragmatic paralysis. The accuracy of these reports can likewise be justifiably doubted. A question was asked about the paralysis of the deltoid muscles. Although it is well established that intercostal paralysis rarely occurs without associated paralysis of the deltoids or upper arms, 40 cases were recorded in which intercostal paralysis was reported without indication of deltoid paralysis. This number is more than would be expected and probably is inaccurate. The remaining 101 patients were indicated as having had paralysis of the intercostal muscles or the diaphragm but were not reported as having difficulty in swallowing or were not stated to have the "bulbar" form of the disease. Thirty-three of these were indicated as having intercostal paralysis alone. Three cases of diaphragmatic paralysis were reported, but this cannot be challenged because, although this condition is rare, a few could be expected.

The data obtained, while not conclusive, are suggestive. Of the 331 patients with poliomyelitis treated in respirators, 150, or 45 per cent, died. One hundred and twenty-seven of the 150 fatal cases were those reported as having the "bulbar" form of the disease or as having difficulty in swallowing. Of the 204 "bulbar" patients 127 died, a fatality rate of 67 per cent, while of the 127 nonbulbar patients 23 died, a fatality rate of 19 per cent. The high mortality in the "bulbar" groups is to be expected. Many of the patients who died were in the machines only a short time and probably could not have been expected to be materially helped.

There were reports of frequent lending of machines from one hospital to another; although commendable, it is evident that in some instances dependence on a borrowed machine must mean confusion and delay in instituting treatment.

1. Wilson, J. L.: Abstract of Report of Respirator Survey for the Year 1940, the National Foundation for Infantile Paralysis, Inc., Dec. 31, 1940.

From this analysis, apparently the practical aspects of the use of respirators for the respiratory paralysis of poliomyelitis is not always satisfactory. Patients with the "bulbar" form of the disease are given respirator treatment in some instances in which such treatment cannot be expected to be of benefit. Diagnosis and judgment related to the employment of respirators should be much improved. Finally, the delay in initiation of respirator treatment appears to be, in many instances, much greater than could possibly be warranted. Although Wilson's report does not make the definite statement, it is clear that the use of respirators for poliomyelitis is often disappointing. Experience with this device certainly does not approach the high expectations for saving lives which were originally anticipated.

BOVINE BLOOD GROUPING

Experimental evidence recently developed leads to the conclusion that there are at least eighteen heritable blood groups in domestic cattle. Indeed, Ferguson¹ of the University of Wisconsin Department of Veterinary Science believes there are as many groups in cattle as there are bovine chromosomes.

Following Landsteiner's demonstration in 1900 of incompatibilities in blood transfusion in man, numerous attempts were made to determine whether similar blood groupings occur in domestic animals. Ottenberg and Friedman,² for example, showed that relatively sluggish intergroup isoagglutination does occur in cattle. Fishbein³ confirmed this observation and concluded from his more extensive series of tests that bovine isoagglutinins are so irregular in titer and distribution as not to allow definite blood grouping. The practical importance of blood incompatibility in veterinary science was shown by Panisset and Verge,⁴ who found that serious toxic reactions were occasionally produced in therapeutic blood transfusions in cattle.

The technic for determining incompatibility used by these earlier investigators was the relatively crude in vitro technic of spontaneous agglutination. A more delicate method of reinforced (or centrifugalized) agglutination was afterward introduced by Levine and Mabee,⁵ by means of which improved technic Little⁶ was able to demonstrate three principal blood groups in domestic cattle, with numerous anomalous reactions suggesting additional groups. Much more reliable specificity studies were afterward made possible by the introduction of the technic of immune isohemolysins. With this technic the Wisconsin veterinarian made four intravenous injections at weekly intervals of 1 liter of citrated daughter blood into the mother and

withdrew presumptive isoimmune serum five days after the fourth injection.

Anaphylactic-like symptoms were noted in several of the cows when transfusion was done subsequently. These symptoms were apparently identical with those occasionally noted in human patients after repeated blood transfusions from the same donor.⁷ Ferguson's erythrocytic classification was based on isohemolytic titer. To determine this titer two volumes of serially diluted maternal isoimmune serum were added to 1 volume of 2.5 per cent suspension of washed daughter corpuscles, and hemolysis was brought about by the addition of 1 volume of normal rabbit complement. The degree of lysis was estimated at the end of two hours, four hours and eighteen hours at room temperature. In all cases the lytic specificity thus deduced was confirmed by the modern technic of specific antibody absorption on washed corpuscles.⁸

Applying these two technics, Ferguson obtained nine different maternal isohemolysins, each reacting specifically or relatively specifically with the corresponding daughter erythrocytes. Seven of these isolysins were qualitatively distinct from one another, by means of which bovine erythrocytes could be divided into seven distinct monovalent groups (A, B, C, E, G, H, I). In addition to these seven basic groups there were numerous bivalent (e. g., GH, DF), trivalent (e. g., GHI) and polyvalent (e. g., ABCE, ACEG) blood groups, thus giving a total of eighteen relatively distinct blood groups in the local herds. Analyses of the paternal and maternal erythrocytic specificities of 104 offspring suggested that five of these blood groupings are inherited independently of one another, each presumably being the expression of a single hereditary gene. Two other specificities, however, are genetically related, being presumably expressions of allomorphic genes.

Ferguson believes that future applications of the same two technics will lead to the identification of an even larger number of bovine blood groups, his predicted number being "equal to the total number of bovine chromosomes." Ferguson's work is of prophetic clinical interest, since it suggests a possible future multiplicity of recognized human blood groups as soon as the modern technic of immune isolysins is adopted in routine clinical laboratories. Such antigenic differentials have, of course, been suggested from a study of the serums of people who have undergone repeated transfusions with the blood of the same donor.⁹

Clinical interest in Ferguson's conclusions is further heightened by the recent discovery of a *Macacus rhesus* antigen (Rh) in many samples of human blood,¹⁰

1. Ferguson, L. C.: *J. Immunol.* **40**: 213 (Feb.) 1941.
2. Ottenberg, Reuben, and Friedman, S. S.: *J. Exper. Med.* **13**: 531, 1911.

3. Fishbein, Morris: *J. Infect. Dis.* **12**: 133, 1913.
4. Panisset, L., and Verge, L.: *Compt. rend. Soc. de biol.* **87**: 870, 1922.

5. Levine, P., and Mabee, J.: *J. Immunol.* **8**: 425 (Nov.) 1923.
6. Little, Ralph B.: *J. Immunol.* **17**: 377 (Nov.) 1929.

7. Lindemann, Edward: *Blood Transfusion*, J. A. M. A. **62**: 293 (March 28) 1914. Bowcock, H. M.: *Bull. Johns Hopkins Hosp.* **32**: 83 (March) 1921.

8. Krumweide, C.; Cooper, G., and Provost, D. J.: *J. Immunol.* **10**: 55 (Jan.) 1925.

9. Wiener, A. S.: *Blood Groups and Blood Transfusion*, ed. 2, Baltimore, Charles S. Thomas, 1939.

10. Landsteiner, K., and Wiener, A. S.: *Proc. Soc. Exper. Biol. & Med.* **43**: 233 (Jan.) 1940.

together with the rapidly accumulating evidence that isolysins against this paternal Rh factor may be the essential etiologic agents in many cases of eclampsia, repeated abortion, icterus gravis neonatorum and erythroblastosis fetalis.¹¹

Current Comment

HEALTH EDUCATION IN THE Y. M. C. A.

The Young Men's Christian Association has long emphasized physical education; more recently it has extended its interest to include health education in the broader sense. A study¹ of health education procedures in four hundred Y. M. C. A.'s has just been conducted by MacGregor. Of the four hundred questionnaires sent out 58 per cent, or two hundred and thirty, were returned. In these questionnaires brief statements were presented as to principles, policies and activities in health education and physical training with provision for voting on each as to whether it was certainly desirable, probably desirable, doubtful, probably undesirable or certainly undesirable and with additional space for recording whether these policies and principles were fully in effect, partially in effect or not in effect at all. When the two hundred and thirty questionnaires had been tabulated, the results were submitted for appraisal to a jury of seven doctors of medicine, seven professors of education and seven Y. M. C. A. secretaries, all versed in health education. Out of these replies, plus the jury's evaluation of the tabulated replies, fifty established principles were enunciated. Of these the following seem of interest to the medical profession:

1. The scope of the health education program in the Y. M. C. A. should include the physical, mental, emotional and social aspects of health and their interrelationship, with special emphasis on the physical.

4. The Y. M. C. A. health education program should contribute to the improvement of community health through work with its members.

6. Health education in the Y. M. C. A. should be a year round program.

15. In general, the approach in health education should be positive, with emphasis on what to do rather than on what not to do.

16. It is fundamental in the health education program that constant recognition be given to individual differences.

19. The effectiveness of the health education program depends in large measure on the competence and training of the director in charge.

21. Incoming members of the Y. M. C. A. should be required to have a physical examination.

22. The physical examination should be made by a doctor of medicine, licensed in the state.

26. The results of the physical examination should be kept in strict confidence.

29. Objective tests of health and fitness should be made available in the physical department with a system of records whereby members may follow their improvement. The limitations of such tests should be recognized.

30. Scientific information should be made available to correct and combat health fads, superstitions, fears and malpractices.

11. Levine, Philip; Katzin, E. M., and Burnham, Lyman: *Isoimmunization in Pregnancy*, J. A. M. A. 116: 825 (March 1) 1941.

1. A Normative Survey of Health Education in the Young Men's Christian Association, prepared by W. Gordon MacGregor, director of physical education, Central Y. M. C. A., Baltimore, mimeographed.

41. The physical director in the Y. M. C. A. may administer tests of physical fitness.

42. The physical director in the Y. M. C. A. may render only first aid treatment in cases of athletic injury.

43. The physical director in the Y. M. C. A. may advise individuals of normal health (nonpathologic cases) regarding the most beneficial type and amount of exercise for conditioning, reducing, body building and correcting posture.

44. The physical director in the Y. M. C. A. may recommend to the individual in normal health (nonpathologic cases) general principles of diet already laid down in books written by doctors for laymen.

46. Orthopedic defects should be referred for diagnosis and treatment to fully and legally qualified practitioners.

47. Diagnosis and treatment of disease and prescription of internal medicine should rest entirely with the medical profession.

48. Discretion should be used in referring individuals to free service institutions.

49. There should be a definite policy for referring members of the Y. M. C. A., on request, to doctors or specialists.

50. This referral policy should have the approval of the local medical society.

This study, which will unquestionably influence the policies in physical training and health education of the Y. M. C. A.'s affairs, is of interest to the medical profession in that it paves the way for cooperation in local programs between the local Y. M. C. A. and the county medical societies.

DIET BY TAXATION

Hardly a person now alive remembers the time when federal taxes were levied alone for the simple purpose of raising revenue. It required no genius to discover that the power of taxation may be put to other uses. Although the Supreme Court of the United States in a memorable decision declared that the power to tax is the power to destroy, few citizens pay much attention to the implications of that statement. In our national life the levying of taxes is being increasingly used as an economic instrument. Taxation is becoming the favorite tool of economic pressure groups who desire to liquidate other pressure groups. The dairy interests, for example, have been conspicuous in their employment of taxation to suppress competing articles of food. Perhaps this example suggested the idea that people could be compelled by taxation to eat what is good for them. In a recent article "Fortification of Foodstuffs"¹ the proposal is made to compel the use of whole wheat bread by placing a tax on white bread and by offering a government subsidy for the manufacture of whole wheat bread. Perhaps some one will next propose the taxation of beef with a subsidy for the pork packers because pork is richer in vitamin B₁. The government could put a similar levy on grapefruit with a subsidy for orange juice because the latter contains a little more vitamin C. Producers of cane sugar might ask for taxation of corn sugar because cane sugar is sweeter, or sheep raisers might urge a tax on cotton goods because woolens are warmer. If it were not that the power of taxation has been so frequently and so outrageously employed, one could hardly take the latest proposal seriously.

1. Luck, J. Murray: *Fortification of Foodstuffs*, Nutrition Conference, University of California, Berkeley, Calif., May 3, 1941; *Science* 91: 31 (July 11) 1941.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

NATIONAL GUARD MEDICAL OFFICERS ON ACTIVE DUTY

Following is a list of the medical officers on duty with National Guard units of the various states which have been called into active service, together with the organization and camp at which they were serving when this report was recently submitted to these headquarters:

ALABAMA

BARNES, Rhett G., Captain, Birmingham, 104th Separate Battalion Coast Artillery (AA) Camp Stewart, Ga.
BROWN, Hunter M., Captain, Birmingham, 167th Inf., Camp Blanding.
FORD, Joseph W., Captain, Gadsden, 167th Inf., Camp Blanding, Fla.
GARY, Robert E., Captain, Tusculumbia, 151st Engineers.
HEADSTREAM, James W., Captain, Mobile, Special Troops, 31st Division, Camp Blanding, Fla.
JENKINS, John F., Jr., Capt., Birmingham, 167th Inf., Camp Blanding.
MAJORS, Webster Blakely, Major, Tuscaloosa, 167th Infantry, Camp Blanding, Fla.
NUNGESTER, Gerold H., Captain, Decatur, 151st Engineers.
O'NEAL, Lester C., Major, Andalusia, 117th Fld. Art., Camp Blanding.
WINDHAM, Samuel W., Capt., Geneva, 117th Fld. Art., Camp Blanding.
WRIGHT, Duward O., Captain, Fort Payne, 167th Inf., Camp Blanding.

ARIZONA

KIRMSE, Alvin, Captain, Tucson, 158th Infantry, Fort Sill, Okla.
PERKINS, Frederick P., Major, Phoenix, 158th Infantry, Fort Sill, Okla.
PHILLIPS, Neal J., Captain, Oatman, 158th Infantry, Fort Sill, Okla.
YOUNT, Clarence E., Jr., Captain, Prescott, 158th Inf., Fort Sill, Okla.

ARKANSAS

ARCHER, Charles A., Jr., 1st Lieut., Hodge, La., 153d Infantry, Camp Joseph T. Robinson, Ark.
BREWER, Howell, Lieut. Colonel, Hot Springs National Park, 153d Infantry, Camp Joseph T. Robinson, Ark.
BRIZZOLARA, Charles M., 1st Lieut., Douglas, Ariz., 142d Field Artillery, Fort Sill, Okla.
BROOKE, Hugh C., Major, Conway, 153d Infantry, Camp Robinson, Ark.
GATES, Stanley M., Major, Monticello, 206th Coast Artillery (AA), Fort Bliss, Texas.
HENRY, Lewis M., Capt., Fort Smith, 142d Fld. Art., Fort Sill, Okla.
HYATT, Cyril L., 1st Lieut., Little Rock, 153d Infantry, Camp Robinson.
HYATT, Robert F., Jr., 1st Lieut., Hodge, La., 153d Infantry, Camp Joseph T. Robinson, Ark.
KELLY, Robert M., 1st Lieut., Sheridan, 206th Coast Artillery (AA), Fort Bliss, Texas.
MONROE, Sanford C., 1st Lieut., Nashville, Tenn., 153d Infantry, Camp Joseph T. Robinson, Ark.
RANEY, Thomas J., Jr., Captain, Little Rock, 206th Coast Artillery (AA), Fort Bliss, Texas.
RICHARDSON, Fount, Major, Fayetteville, 142d Fld. Artillery, Fort Sill.
SISCO, Friedman, Capt., Springdale, 142d Fld. Artillery, Fort Sill, Okla.

CALIFORNIA

BERMAN, Irving S., 1st Lieut., Los Angeles, 115th Medical Regiment, Camp San Luis Obispo, Calif.
CHRISTIAN, Sam G., Captain, Sacramento, 184th Infantry, Camp San Luis Obispo, Calif.
COLBURN, Justin R., Captain, Oakland, 143d Field Artillery, Camp San Luis Obispo, Calif.
COLBY, Elliott G., Major, San Diego, 251st Coast Artillery (AA), Camp Malakole, Oahu, Hawaii.
COLM, Cyrenus L., 1st Lieut., Dulham, 115th Medical Regiment, Camp San Luis Obispo, Calif.
DAWSON, George I., Major, Napa, 184th Inf., Camp San Luis Obispo.
DEAN, James R., Lieut. Colonel, Los Angeles, 115th Medical Regiment, Camp San Luis Obispo, Calif.
GALBRAITH, Harold F., 1st Lieut., Ventura, 144th Field Artillery, Fort Lewis, Wash.
GHORMLEY, Verne G., Captain, Fresno, 185th Infantry, Camp San Luis Obispo, Calif.
GIDLEY, Donald S., Captain, Ontario, 185th Inf., Camp San Luis Obispo.
GRAESER, Henrik S., 1st Lieut., Woodland, 184th Infantry, Camp San Luis Obispo, Calif.
HANSEN, Robert M., 1st Lieut., Fresno, 185th Infantry, Camp San Luis Obispo, Calif.

HARDING, William F. B., Captain, Sacramento, 184th Infantry, Camp San Luis Obispo, Calif.
HELSLEY, Gordon F., Major, San Francisco, 250th Coast Artillery (TD), Camp McQuaide, Calif.
HESSER, Robert N., Captain, Los Angeles, 160th Infantry.
ISOARD, Max C., Major, Sacramento, 184th Infantry, Camp San Luis Obispo, Calif.
JENNEY, Evelyn Ross, Capt., Los Angeles, 115th Quartermaster Reg.
JONES, Glen E., Captain, Los Angeles, 160th Infantry.
KELSO, Raymond W., Captain, Long Beach, 251st Coast Artillery (AA), Camp Malakole, Oahu, Hawaii.
LAGEN, John B., Major, San Francisco, 159th Infantry, Camp San Luis Obispo, Calif.
LAUER, Marvin S., Captain, Compton, 115th Medical Regiment, Camp San Luis Obispo, Calif.
LOVELL, Robert A., Major, Alhambra, 160th Infantry.
LUPPI, Alfred P., 1st Lieut., Santa Barbara, 144th Fld. Art., Fort Lewis.
MacCALLUM, Daniel B., Colonel, Los Angeles, 115th Medical Regiment, Camp San Luis Obispo, Calif.
MIRANDA, Melvyn R., Captain, Long Beach, 115th Medical Regiment, Camp San Luis Obispo, Calif.
PEARCE, Carlyle M., Major, Oakland, 159th Inf., Camp San Luis Obispo, Calif.
PHILLIPS, Albert D., Major, Sacramento, 184th Infantry, Camp San Luis Obispo, Calif.
PREUSS, Charles August, Major, Santa Barbara, 144th Field Artillery, Fort Lewis, Wash.
RAND, Frederick S., Captain, Los Angeles, 115th Medical Regiment, Camp San Luis Obispo, Calif.
RITCHIE, Douglas W., Captain, Hondo, 115th Medical Regiment, Camp San Luis Obispo, Calif.
ROGERS, Maurice B., 1st Lieut., Los Angeles, 115th Quartermaster Regt.
ROHRBACHER, George H., Lieut. Colonel, Stockton, 115th Medical Regiment, Camp San Luis Obispo, Calif.
SCHUMACHER, Irwin C., Lieut. Colonel, San Francisco, 159th Infantry, Camp San Luis Obispo, Calif.
SMITH, Reynolds D., Major, Los Angeles, 115th Observation Squadron.
STILSON, Homer O., 1st Lieut., National City, 251st Coast Artillery (AA), Camp Malakole, Oahu, Hawaii.
STRYBLE, Francis J., 1st Lieut., Oakland, 159th Infantry, Camp San Luis Obispo, Calif.
SURACI, Rocco T., 1st Lieut., Oakland, Special Troops, 40th Division, Camp San Luis Obispo, Calif.
SYMAN, Leo W., 1st Lieut., Los Angeles, 115th Medical Regiment, Camp San Luis Obispo, Calif.
TABER, Kenneth W., Captain, Pasadena, 115th Medical Regiment, Camp San Luis Obispo, Calif.
THOMAS, Bert S., Lieut. Colonel, Sacramento, State Staff.
THOMPSON, Claude V., Major, Lodi, 143d Field Artillery, Camp San Luis Obispo, Calif.
VAN DEVENTER, William C., Captain, Aptos, 250th Coast Artillery (TD), Camp McQuaide, Calif.
WHITE, Marcus D., Major, Ontario, 115th Medical Regiment, Camp San Luis Obispo, Calif.

COLORADO

BARFIEI, James Jackson, Capt., Colorado Springs, 168th Fld. Art.
BRETHOUWER, Norman A., Captain, Montrose, 157th Infantry.
HARTSHORN, Duane F., Lieut. Colonel, Ft. Collins, 124th Med. Squad.
STANDER, Thomas R., Major, Denver, 168th Field Artillery.
TOWBIN, Samuel, Major, Denver, 157th Infantry.
TURNER, Carlos L., Capt., Denver, 120th Obser. Squadron, Fort Bliss.
WHITELEY, Philip W., Lieut. Colonel, Denver, State Staff.

CONNECTICUT

ABRASHKIN, Mortimer D., Captain, New Haven, 102d Infantry, Camp Blanding, Fla.
ANTEL, Maxwell J., Major, Bridgeport, 242d Coast Artillery, Ft. Terry.
ANTON, Michael C., 1st Lieut., New Haven, 242d Coast Artillery, Fort Terry, N. Y.
AWDZIEWICZ, Francis J., 1st Lieut., Stamford, 192d Field Artillery, Camp Blanding, Fla.
BOYARSKY, Harry M., Captain, Wallingford, 118th Medical Regiment, Camp Blanding, Fla.
CIMINERA, Joseph A., Lieut. Colonel, Waterbury, 102d Infantry, Camp Blanding, Fla.
COGLAND, John L., Captain, Hartford, 118th Observation Squadron.
COLE, Milton J., 1st Lieut., Hartford, 169th Inf., Camp Blanding, Fla.

COMFORT, Charles W., Jr., Colonel, New Haven, 118th Medical Regiment, Camp Blanding, Fla.
 CRESSY, Norman L., 1st Lieut., Meriden, 169th Inf., Camp Blanding.
 DE PASQUALE, Francis L., Major, Hartford, 208th Coast Artillery, Camp Edwards, Mass.
 DE PASQUALE, John A., Captain, Hartford, 118th Medical Regiment, Camp Blanding, Fla.
 DESMOND, Charles T., 1st Lieut., New York, N. Y., 208th Coast Artillery, Camp Edwards, Mass.
 DISKAN, Albert E., 1st Lieut., Manchester, 169th Inf., Camp Blanding.
 DUFFY, Leo T., Major, Hartford, 169th Infantry, Camp Blanding, Fla.
 FINDORAK, Francis G., 1st Lieut., Stratford, 118th Medical Regiment, Camp Blanding, Fla.
 FOSTER, Albert D., Jr., 1st Lieut., Hartford, 169th Inf., Camp Blanding.
 FRIEDBERG, Isadore H., 1st Lieut., Brookline, Mass., 169th Infantry, Camp Blanding, Fla.
 HABERLIN, Chester E., Major, Stratford, 118th Medical Regiment, Camp Blanding, Fla.
 HEIDGER, Luther C., Capt., Stratford, 242d Coast Artillery, Fort Terry.
 HERSEY, Thomas F., 1st Lieut., Boston, 192d Fld. Art., Camp Blanding.
 KENNEDY, William C., Captain, Torrington, 102d Inf., Camp Blanding.
 LANKIN, Joseph J., 1st Lieut., Hartford, 118th Medical Regiment, Camp Blanding, Fla.
 LUDWIG, Edward W., Captain, Ansonia, 118th Medical Regiment, Camp Blanding, Fla.
 MAYNARD, Harry H., Lieut. Colonel, New Haven, 118th Medical Regiment, Camp Blanding, Fla.
 O'BRAKY, George H., Major, New Haven, 118th Medical Regiment, Camp Blanding, Fla.
 ROY, Joseph L., Captain, North Grosvenor Dale, 208th Coast Artillery, Camp Edwards, Mass.
 SAVAGE, Philip J., Major, New London, 192d Field Artillery, Camp Blanding, Fla.
 SMITH, William B., Major, Wethersfield, State Staff.
 SNURKOWSKI, Charles V., Major, New Haven, 118th Medical Regiment, Camp Blanding, Fla.
 SQUILLANTE, Orlando J., 1st Lieut., Danbury, 118th Medical Regiment, Camp Blanding, Fla.
 YABOVITZ, Myer, 1st Lieut., Danbury, 118th Medical Regiment, Camp Blanding, Fla.

DELAWARE

BECK, Joseph R., Captain, Dover, 198th Coast Artillery, Camp Edwards.
 LAWRENCE, Charles T., Jr., Captain, Wilmington, 198th Coast Artillery, Camp Edwards, Mass.
 MC DANIEL, Joseph S., Jr., 1st Lieut., Dover, 261st Coast Artillery, Fort Du Pont, Del.
 WASHBURN, Victor D., Major, Wilmington, State Staff.

DISTRICT OF COLUMBIA

BUTLER, DeRuyter A., Captain, 372d Infantry.
 GRAYSON, Stewart M., Major, 260th Coast Artillery, Fort Bliss, Texas.
 HECKER, Robert C., Captain, 121st Engineers, Fort Meade, Md.
 McKAIG, Malcolm C., Captain, 260th Coast Artillery, Fort Bliss, Texas.
 MUSSO, Charles M., Jr., Capt., 104th Quartermaster Regt., Fort Meade.
 NORCROSS, John A., 1st Lieut., 121st Engineers, Fort Meade, Md.
 SUTTENFIELD, Frederick D., Major, 121st Engineers, Fort Meade, Md.
 TAGGART, Samuel R., Major, 104th Quartermaster Regt., Fort Meade.
 TIERNEY, Gerald M., Captain, 260th Coast Artillery, Fort Bliss, Texas.
 TODD, Oswald V., Captain, Special Troops, 29th Division, Fort Meade.

FLORIDA

BOSWORTH, Joseph M., Jr., Captain, Lakeland, 116th Field Artillery.
 GABLE, Nonie W., Major, St. Petersburg, 116th Field Artillery.
 HARRELL, Henry L., Major, Ocala, 265th Coast Artillery, Fort Crockett.
 HOPKINS, Clack D., Captain, Tampa, 116th Field Artillery.
 MANSON, Alexander M., Captain, Jacksonville, 265th Coast Artillery, Fort Crockett, Texas.
 MARTIN, Emmett E., Captain, Haines City, 106th Engineers.
 SCOTT, Douglas G., Major, Sanford, 124th Inf., Camp Blanding, Fla.
 SISLER, Bruce H., Major, Miami Beach, 106th Medical Regiment, Camp Blanding, Fla.
 STAMPS, Walker, Captain, Jacksonville, 124th Inf., Camp Blanding, Fla.
 YOUNANS, Corren P., Lieut. Colonel, Miami, 106th Medical Regiment, Camp Blanding, Fla.

GEORGIA

BARFIELD, William E., 1st Lieut., Atlanta, 179th Field Artillery, Camp Blanding, Fla.
 BROOKS, Henry C., Jr., Captain, Augusta, 214th Coast Artillery.
 BUTNER, John H., Captain, Atlanta, 105th Medical Regiment, Fort Jackson, S. C.
 CAMPBELL, James L., Jr., Captain, Atlanta, 179th Field Artillery, Camp Blanding, Fla.
 CARY, Howard R., Captain, Milledgeville, 214th Coast Artillery.
 COCHRAN, George H., Major, Atlanta, 105th Medical Regiment, Fort Jackson, S. C.
 ETHERIDGE, William N., 1st Lieut., Atlanta, 105th Medical Regiment, Fort Jackson, S. C.
 HENDRY, William A., 1st Lieut., Blackshear, 101st Separate Battalion, Coast Artillery.
 BAULDIN, John T., Captain, Atlanta, 179th Field Artillery, Camp Blanding, Fla.
 MCARTHUR, Charles E., Capt., Cordele, 121st Inf., Fort Jackson, S. C.
 MORTLEY, Hugh G., Major, Atlanta, 179th Fld. Art., Camp Blanding.
 PATTON, Samuel E., Captain, Macon, 121st Infantry, Fort Jackson, S. C.
 PIRKLE, James C., Captain, Milledgeville, 121st Inf., Fort Jackson, S. C.

REDMOND, Clarence R., 1st Lieut., Savannah, 118th Field Artillery.
 ROBERTS, Bureh J., Captain, Cornelia, Special Troops, 30th Division, Fort Jackson, S. C.
 SCHAEFER, William B., Major, Toccoa, 214th Coast Artillery.

IDAHO

BECK, Wilford W., Jr., 1st Lieut., Blackfoot, 183d Field Artillery, Fort Francis E. Warren, Wyo.
 HANCHER, William H., Captain, Weiser, 183d Field Artillery, Fort Francis E. Warren, Wyo.
 ROTHMAN, Benjamin G., Captain, Grimes Pass, 116th Medical Regiment, Fort Lewis, Wash.
 RULIEN, Ward A., Captain, Wendell, 116th Medical Regiment, Fort Lewis, Wash.
 TALBOT, Robert E., Lieut. Colonel, Wilder, 183d Field Artillery, Fort Francis E. Warren, Wyo.
 VAN DORN, Robert W., Major, Coeur d'Alene, 148th Field Artillery.

ILLINOIS

ALLEN, Robert A., Capt., Evanston, 122d Fld. Artillery, Camp Forrest.
 ASH, Alfred S., Captain, Quincy, 130th Infantry, Camp Forrest, Tenn.
 BAKER, Eugene L., Major, Chicago, 108th Med. Regt., Camp Forrest.
 BAY, Anthony, Captain, Chicago, 108th Med. Regt., Camp Forrest, Tenn.
 BEDESSEM, Philip M., Lieut. Colonel, Hines, 108th Medical Regiment, Camp Forrest, Tenn.
 BELMONTE, John V., Captain, Chicago, 132d Inf., Camp Forrest, Tenn.
 CECALA, Philip J., 1st Lieut., Chicago, 132d Inf., Camp Forrest, Tenn.
 CHWATAL, Herbert E., Capt., Chicago, 108th Med. Regt., Camp Forrest.
 CILELLA, Salvatore G., 1st Lieut., Chicago, 132d Inf., Camp Forrest.
 COMER, Fay S., Captain, Cairo, 130th Infantry, Camp Forrest, Tenn.
 COMESS, Oscar H., Captain, Chicago, 131st Infantry, Camp Forrest.
 COOK, Mario V., 1st Lieut., Chicago, 132d Infantry, Camp Forrest.
 CRANDLE, Ellis R., Captain, Carbondale, 130th Infantry, Camp Forrest.
 CUMMING, Thomas S., 1st Lieut., Elgin, 108th Medical Regiment, Camp Forrest, Tenn.
 DAVIS, Landis Y., Captain, Baylis, 130th Infantry, Camp Forrest, Tenn.
 DAY, Ernest C., Capt., Chicago, 108th Med. Regt., Camp Forrest, Tenn.
 DOLPH, Ivar E., Captain, Manito, 130th Infantry, Camp Forrest, Tenn.
 EASTON, James W., Captain, Chicago, 108th Engineers, Camp Forrest.
 EHRlich, Maximilian C., Lieut. Colonel, Chicago, 124th Field Artillery, Camp Forrest, Tenn.
 ENTIN, Samson D., 1st Lieut., Chicago, 108th Med. Regt., Camp Forrest.
 FALLER, Adolph, Jr., Captain, Chicago, 124th Fld. Art., Camp Forrest.
 FELICELLI, Nello M., Captain, Chicago, Special Troops, 33d Division, Camp Forrest, Tenn.
 FRISCH, Isaac J., Lieut. Colonel, Chicago, 108th Engineers, Camp Forrest, Tenn.
 GIGANTI, James J., 1st Lieut., Chicago, Special Troops, 33d Division, Camp Forrest, Tenn.
 GOLDSTONE, James K., Captain, Chicago, 108th Medical Regiment, Camp Forrest, Tenn.
 GROTH, Norton R., 1st Lieut., Chicago, 108th Med. Regt., Camp Forrest.
 GUERIN, John W., Captain, Cicero, 122d Fld. Artillery, Camp Forrest.
 HOFFSTADT, John P., Lieut. Colonel, Chicago, 131st Infantry, Camp Forrest, Tenn.
 HOLLADAY, William T., Captain, Amboy, 129th Inf., Camp Forrest.
 HUNT, Robert E., Capt., Springfield, 106th Cav., Camp Livingston, La.
 JOHNSON, Lester S., Major, Chicago, 122d Fld. Artillery, Camp Forrest.
 KOCOUR, Elmer J., Captain, Chicago, 132d Infantry, Camp Forrest.
 KOENIG, Frank J., Captain, Normal, 108th Quartermaster Regiment, Camp Forrest, Tenn.
 LAGERQUIST, Howard D., Captain, Chicago, 108th Ohser. Squadron.
 MACNAMARA, Homer P., Major, Springfield, 106th Cavalry, Camp Livingston, La.
 MAILER, Andrew R., Major, Galesburg, 123d Fld. Art., Camp Forrest.
 MAYES, Corwin S., Major, Springfield, State Staff.
 MC KINLEY, James J., Colonel, Oak Park, 108th Medical Regiment, Camp Forrest, Tenn.
 MC NAMARA, Edward W., 1st Lieut., Chicago, 108th Medical Regiment, Camp Forrest, Tenn.
 MERCER, Ray, Lieut. Colonel, Quincy, 130th Infantry, Camp Forrest.
 MINDLIN, Joseph, 1st Lieut., Chicago, 108th Med. Regt., Camp Forrest.
 MOHR, Walter C., Major, Chicago, 108th Med. Regt., Camp Forrest.
 MOLENGRAFT, Cornelius J., Captain, Chicago, 108th Medical Regiment, Camp Forrest, Tenn.
 MULLEN, Timothy F., Major, Seneca, 129th Inf., Camp Forrest, Tenn.
 PARKER, Harry J., 1st Lieut., Chicago, 108th Med. Regt., Camp Forrest.
 POST, John, Captain, Chicago, 202d Coast Artillery.
 PRITIKIN, Roland I., Major, Chicago, 108th Quartermaster Regiment, Camp Forrest, Tenn.
 PRENPAS, Thomas G., Major, Chicago, 131st Infantry, Camp Forrest.
 QUEN, Frank B., Major, Chicago, 108th Med. Regt., Camp Forrest.
 SMITH, Durand, Captain, Chicago, 108th Med. Regt., Camp Forrest.
 SOROSKY, Solly, 1st Lieut., Chicago, 131st Infantry, Camp Forrest.
 STETTAUER, Joseph L., Lieut. Colonel, Chicago, 108th Medical Regiment, Camp Forrest, Tenn.
 SWEENEY, Anthony J., 1st Lieut., Chicago, 108th Medical Regiment, Camp Forrest, Tenn.
 SWEITZER, Caesar J., 1st Lieut., Chicago, 108th Medical Regiment, Camp Forrest, Tenn.
 TAMBONE, John R., 1st Lieut., Chicago, 108th Medical Regiment, Camp Forrest, Tenn.
 VOLLER, Richard L., 1st Lieut., Cicero, 132d Infantry, Camp Forrest.
 WAUD, Sydney P., Capt., Chicago, 106th Cavalry, Camp Livingston, La.
 WHITFIELD, Harvey J., Captain, Chicago, 124th Field Artillery, Camp Forrest, Tenn.
 ZEE, Maurice L., 1st Lieut., Chicago, 122d Field Artillery, Camp Forrest.

INDIANA

BLOOM, Asa W., Captain, Marion, 150th Field Artillery, Camp Shelby, Miss.
BROWN, Robert M., Captain, Marion, 113th Medical Regiment, Camp Shelby, Miss.
CARREL, Francis E., 1st Lieut., Indianapolis, 151st Infantry, Camp Shelby, Miss.
COMSTOCK, Glenn E., Major, Gary, 113th Engineers.
GLOCK, Maurice E., Major, Fort Wayne, 152d Infantry, Camp Shelby.
GREIST, John H., Major, Indianapolis, 113th Med. Regt., Camp Shelby.
HALLAM, Franklin T., Colonel, Indianapolis, 113th Medical Regiment, Camp Shelby, Miss.
HART, Lempha P., Captain, Evansville, 113th Med. Regt., Camp Shelby.
HOWELL, Robert D., Major, Indianapolis, 113th Medical Regiment, Camp Shelby, Miss.
JOBES, James E., Captain, Indianapolis, 113th Medical Regiment, Camp Shelby, Miss.
KEELING, Forrest E., Major, Portland, 139th Field Artillery, Camp Shelby, Miss.
LANSFORD, John, Capt., Red Key, 139th Field Artillery, Camp Shelby.
LEE, Glen W., Captain, Richmond, State Staff, Indianapolis.
MANLEY, Charles N., Captain, Rising Sun, 151st Inf., Camp Shelby.
MARSHALL, Albert L., Jr., Captain, Indianapolis, 151st Infantry, Camp Shelby, Miss.
MUELLER, Donald F., 1st Lieut., Fort Wayne, 152d Infantry, Camp Shelby, Miss.
MULLEN, Joseph J., 1st Lieut., Fort Wayne, 152d Inf., Camp Shelby.
OYER, John H., Captain, Fort Wayne, 152d Infantry, Camp Shelby.
PEELER, Malcolm O., 1st Lieut., Fort Wayne, 152d Inf., Camp Shelby.
PFAFF, Dudley A., Captain, Indianapolis, 113th Observation Squadron.
PRAMSEY, Frank B., Major, Indianapolis, 113th Medical Regiment, Camp Shelby, Miss.
RITCHIEY, John A., Capt., Marion, 150th Field Artillery, Camp Shelby.
SCOTT, Ivan W., 1st Lieut., Indianapolis, 151st Infantry, Camp Shelby.
SUSS, David H., Lieut. Colonel, Indianapolis, 113th Medical Regiment, Camp Shelby, Miss.
WARFEL, Frederick C., Major, Indianapolis, 151st Inf., Camp Shelby.
WASHBURN, Richard N., Captain, Rensselaer, 113th Medical Regiment, Camp Shelby, Miss.

IOWA

ANDERSON, Nevin B., Lieut. Colonel, Des Moines, 113th Cavalry, Camp Bowie, Texas.
ANSPACH, Royal S., Major, Mitchellville, 136th Medical Regiment, Camp Claiborne, La.
BAKER, Charles J., Captain, Fort Dodge, 136th Medical Regiment, Camp Claiborne, La.
BEAUMONT, Fred H., Major, Council Bluffs, 136th Med. Regt., Camp Claiborne, La.
BRINKHOUS, Kenneth M., Captain, Iowa City, 136th Medical Regiment, Camp Claiborne, La.
BURDICK, Francis D., 1st Lieut., Shenandoah, 168th Infantry, Camp Claiborne, La.
BURGESON, Floyd M., Captain, Des Moines, 168th Infantry, Camp Claiborne, La.
BUSH, Earl B., Colonel, Ames, 136th Med. Regt., Camp Claiborne, La.
CASTELL, John W., Captain, Fairfield, 133d Infantry, Camp Claiborne.
CONNELL, John R., Jr., Captain, Des Moines, 136th Medical Regiment, Camp Claiborne, La.
CONNER, John D., 1st Lieut., Nevada, 136th Medical Regiment, Camp Claiborne, La.
CORCORAN, Thomas E., 1st Lieut., Rock Rapids, 136th Medical Regiment, Camp Claiborne, La.
DAHL, Harry W., Lieut. Colonel, Des Moines, 168th Infantry, Camp Claiborne, La.
DETERS, Donald C., Capt., Schaller, 136th Med. Regt., Camp Claiborne.
ERVIN, Lindsay J., 1st Lieut., Baltimore, Md., 113th Cav., Camp Bowie.
FOURT, Arthur S., Lieut. Colonel, Iowa City, 136th Medical Regiment, Camp Claiborne, La.
GITTIER, Ludwig, Major, Fairfield, 133d Infantry, Camp Claiborne, La.
HARDIN, Robert C., Captain, Iowa City, 136th Medical Regiment, Camp Claiborne, La.
HEALY, Maurice J., Capt., Boone, 185th Fld. Artillery, Camp Claiborne.
HOWAR, Bruce F., 1st Lieut., Jewell, 136th Med. Regt., Camp Claiborne.
JACOBS, Carl A., 1st Lieut., Iowa City, 136th Medical Regiment, Camp Claiborne, La.
JENKINS, George D., Major, Burlington, 136th Medical Regiment, Camp Claiborne, La.
JIRSA, Harold O., Captain, Cedar Rapids, 136th Medical Regiment, Camp Claiborne, La.
KEITH, John J., Captain, Marion, 136th Med. Regt., Camp Claiborne.
KUNTZ, George S., Captain, Sibley, 136th Med. Regt., Camp Claiborne.
LOCHER, Robert C., Captain, Cedar Rapids, 136th Medical Regiment, Camp Claiborne, La.
LUDWICK, Arthur Lee, Jr., 1st Lieut., Waterloo, 133d Infantry, Camp Claiborne, La.
MARTIN, Lovell E., 1st Lieut., Des Moines, 113th Cav., Camp Bowie.
MERKEL, Byron M., Captain, Des Moines, State Staff.
MEYERS, Henry A., Major, Davenport, 185th Field Artillery, Camp Claiborne, La.
MINKEL, Roger M., Captain, Newton, 136th Medical Regiment, Camp Claiborne, La.
PARKE, John, Captain, Oakdale, La., 136th Medical Regiment, Camp Claiborne, La.
PAULUS, Edward W., Major, Iowa City, 136th Medical Regiment, Camp Claiborne, La.
PETERSEN, Vernon W., Major, Iowa City, 136th Medical Regiment, Camp Claiborne, La.

PRATT, Elmer B., 1st Lieut., Des Moines, 168th Infantry, Camp Claiborne, La.
PRENTISS, Robert J., Captain, Iowa City, 136th Medical Regiment, Camp Claiborne, La.
REDMOND, James J., Captain, Cedar Rapids, 136th Medical Regiment, Camp Claiborne, La.
SAAR, Jesse L., Jr., 1st Lieut., Iowa City, 136th Medical Regiment.
SANDERS, Matthew G., Captain, Fort Dodge, 136th Medical Regiment, Camp Claiborne, La.
SEDLACEK, Leo B., Captain, Cedar Rapids, 136th Medical Regiment, Camp Claiborne, La.
SENFELD, Sidney, 1st Lieut., Belle Plaine, 185th Field Artillery, Camp Claiborne, La.
SHEPHERD, Loyd K., 1st Lieut., Oakville, 136th Medical Regiment, Camp Claiborne, La.
SMITH, Rupard G., 1st Lieut., Cedar Falls, 133d Inf., Camp Claiborne.
TINLEY, Robert E., Captain, Council Bluffs, Special Troops, 34th Division, Camp Claiborne, La.
WOODHOUSE, Keith W., Captain, Cedar Falls, 136th Medical Regiment, Camp Claiborne, La.
WURL, Otto A., 1st Lieut., Council Bluffs, Special Troops, 34th Division, Camp Claiborne, La.
YETTER, William L., 1st Lieut., Iowa City, 136th Medical Regiment, Camp Claiborne, La.

KANSAS

ANDERSON, Arthur S., Major, Lawrence, 127th Field Artillery, Camp Joseph T. Robinson, Ark.
EPP, Frederic O., 1st Lieut., Larned, 137th Inf., Camp Robinson, Ark.
GLEASON, Kenneth J., Captain, Newton, 127th Field Artillery, Camp Joseph T. Robinson, Ark.
GLOYNE, Louis B., Major, Kansas City, 161st Field Artillery, Camp Joseph T. Robinson, Ark.
HAMMEL, Seth A., Lieut. Colonel, Topeka, State Staff.
KNAPP, Leslie E., Captain, Wichita, 157th Infantry.
LAWRENCE, Edward K., Major, Hiawatha, 130th Field Artillery, Camp Joseph T. Robinson, Ark.
MOTT, James M., Capt., Lawrence, 127th Fld. Artillery, Camp Robinson.
PINSKER, Jacob A., Captain, Hutchinson, 130th Field Artillery, Camp Joseph T. Robinson, Ark.
ROSS, Earl B., Major, San Antonio, Tex., 137th Inf., Camp Robinson.
WALTERS, Byron W., 1st Lieut., Lawrence, 127th Field Artillery, Camp Joseph T. Robinson, Ark.

KENTUCKY

ALBRITTON, James E., 1st Lieut., Paducah, 106th Separate Battalion, Coast Artillery (AA).
BILLINGTON, Charles B., Captain, Richmond, 113th Medical Regiment, Camp Shelby, Miss.
BIZOT, Byron, Captain, Louisville, 138th Field Artillery, Camp Shelby.
BLANTON, Harvey C., Captain, Richmond, 113th Medical Regiment, Camp Shelby, Miss.
CHOATE, Benjamin D., Lieut. Colonel, Louisville, 138th Field Artillery.
DEDDENS, Lloyd E., Capt., Louisville, 138th Fld. Art., Camp Shelby.
HAYNES, Philip E., Major, Hopkinsville, 123d Cavalry.
LAMB, William F., Captain, Russellville, 149th Infantry.
MERENBLOOM, Derbert S., 1st Lieut., Corbin, 113th Quar. Regt.
PIPES, James L., 1st Lieut., Mackville, 113th Med. Regt., Camp Shelby.
RIGGS, Robert C., Captain, Lexington, 123d Cavalry.
ROBBINS, Ballard F., Captain, Berea, 113th Med. Regt., Camp Shelby.
RUTLEDGE, Harold H., Captain, Williamsburg, 113th Medical Regiment, Camp Shelby, Miss.
WALKER, Jehu C., 1st Lieut., Packard, 149th Infantry.
WELLS, George M., Major, Bowling Green, 149th Infantry.

LOUISIANA

BISHOP, Clarence A., Captain, New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
CHAUVIN, Enstace V., Jr., 1st Lieut., Lafayette, 156th Infantry, Camp Blanding, Fla.
CRAWFORD, Walter J., 1st Lieut., New Orleans, 141st Field Artillery, Camp Shelby, Miss.
DOUGHERTY, Cary M., 1st Lieut., New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
FRESH, Chester S., Major, New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
GARBER, Jared Y., Captain, Lake Charles, 156th Inf., Camp Blanding.
GORMAN, Cornelius E., Major, New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
GRAY, Courtland J., Jr., Major, Monroe, 204th Coast Artillery, Camp Huilen, Texas.
HERBERT, Thomas E., 1st Lieut., New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
HOWLE, Myron G., 1st Lieut., New Orleans, 141st Field Artillery, Camp Shelby, Miss.
KRAMER, Elmer E. W., 1st Lieut., New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
LAMBERT, Lamar L., 1st Lieut., New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
LA NASA, James J., 1st Lieut., New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
LE DOUX, Marion J., 1st Lieut., New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
LUCAS, Richard A., 1st Lieut., New Orleans, 122d Obs. Squadron.
MC CABE, James S., 1st Lieut., New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
MILAM, DeWitt, T., Major, Monroe, 156th Infantry, Camp Blanding.
MOGABAB, Anees, Colonel, New Orleans, 106th Medical Regiment, Camp Blanding, Fla.

PARRINO, Paul S., Major, Franklin, 141st Field Artillery, Camp Shelby.
RAND, Paul King, Jr., 1st Lieut., New Orleans, 156th Infantry, Camp Blanding, Fla.
ROGERS, Gordon K., Captain, New Orleans, 105th Separate Battalion, Coast Artillery, Camp Hulen, Texas.
ROMEO, Zachary J., Captain, New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
SCOTT, Wood H., 1st Lieut., Bonita, 204th Coast Artillery, Camp Hulen.
TURK, William B., 1st Lieut., New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
VAUDRY, James W., Captain, New Orleans, 106th Medical Regiment, Camp Blanding, Fla.
WHITE, James A., Jr., Captain, Alexandria, 156th Inf., Camp Blanding.
WHITTINGTON, Robert D., Jr., Captain, Bossier, 204th Coast Artillery, Camp Hulen, Texas.

MAINE

ASALI, Louis A., Capt., Portland, 240th Coast Artillery, Fort Williams, Me.
BEEAKER, Vincent H., 1st Lieut., Lewiston, 103d Inf., Camp Blanding.
CASEY, William L., Major, Portland, 103d Inf., Camp Blanding, Fla.
CUTLER, Lawrence M., Captain, Bangor, 152d Field Artillery.
DUNHAM, Carl E., Captain, Portland, 103d Inf., Camp Blanding, Fla.
FOGG, Charles E., Major, Portland, 240th Coast Artillery, Fort Williams, Me.
FORD, Leonard H., Lieut. Colonel, Bangor, 152d Field Artillery.
GETCHELL, Ralph A., Captain, Portland, 240th Coast Artillery, Fort Williams, Me.
GUMPRECHT, Walter R., Major, Bangor, 103d Inf., Camp Blanding.
PRESSEY, Harold E., Major, Bangor, 152d Field Artillery.
TOWNE, Charles E., Captain, Waterville, 103d Infantry, Camp Blanding.
TOWNE, John G., Lieut. Colonel, Waterville, State Staff.

MARYLAND

AUBREY, John F., Captain, Baltimore, 104th Med. Regt., Fort Meade.
BEACHAM, Edmund G., 1st Lieut., Baltimore, 175th Inf., Fort Meade.
BUETTNER, Henry F., Major, Baltimore, 104th Med. Regt., Fort Meade.
BURGER, Thomas T., Capt., Baltimore, 110th Fld. Artillery, Fort Meade.
COOPER, Donald D., Captain, Towson, 104th Med. Regt., Fort Meade.
ELEDER, Franklin C., Major, Baltimore, 104th Med. Regt., Fort Meade.
FRANKLIN, Joseph P., Major, Cumberland, 115th Infantry.
GLASSMAN, Edward L., 1st Lieut., Baltimore, 175th Inf., Fort Meade.
HUTCHINS, Thomas M., 1st Lieut., Baltimore, 104th Medical Regiment, Fort George G. Meade, Md.
KIMBERLY, Robert C., Captain, Catonsville, 104th Medical Regiment.
KOONTZ, Amos R., Lieut. Colonel, Baltimore, State Staff.
KUNKOWSKI, Mitchell F., 1st Lieut., Baltimore, 104th Medical Regiment, Fort George G. Meade, Md.
MARTIN, Clarence W., II, 1st Lieut., Baltimore, 175th Inf., Fort Meade.
NUTTALL, James B., Captain, Baltimore, 104th Med. Regt., Fort Meade.
SABATINO, Bernard J., 1st Lieut., Baltimore, 104th Medical Regiment, Fort George G. Meade, Md.
SHELLEY, Harry S., Major, Baltimore, 175th Infantry, Fort Meade.
SINTON, William A., Major, Baltimore, 110th Fld. Artillery, Fort Meade.
STURGIS, William J., Jr., Captain, Baltimore, 110th Field Artillery, Fort George G. Meade, Md.
THOMAS, Ramsay B., Captain, Baltimore, 104th Observation Squadron.
TRIPLETT, William H., Lieut. Colonel, Baltimore, 104th Medical Regiment, Fort George G. Meade, Md.
URLOCK, John P., Jr., 1st Lieut., Baltimore, 104th Medical Regiment, Fort George G. Meade, Md.
WANNER, Jesse R., Jr., 1st Lieut., Baltimore, 175th Inf., Fort Meade.
WILSON, Harry T., Jr., 1st Lieut., Baltimore, 175th Inf., Fort Meade.

MASSACHUSETTS

ABODEELY, Robert A., 1st Lieut., Worcester, 181st Infantry, Camp Edwards, Mass.
ABRIEL, Albert G., 1st Lieut., Boston, 180th Field Artillery.
BAER, Victor, Major, Boston, 101st Engineers.
BAILEY, Karl R., Colonel, Boston, 101st Med. Regt., Camp Edwards.
BAIN, David J., 1st Lieut., Lawrence, 101st Med. Regt., Camp Edwards.
BANQUER, Jacob E., Major, Boston, 241st Coast Artillery, Fort Andrews, Mass.
BARRY, John M., 1st Lieut., Lawrence, 101st Medical Regiment, Camp Edwards, Mass.
BEREZIN, Martin A., Capt., Medfield, 101st Med. Regt., Camp Edwards.
BOZIGIAN, Haig, 1st Lieut., Somerville, 101st Engineers.
CASEY, Daniel F., Jr., 1st Lieut., Webster, 181st Inf., Camp Edwards.
CHERNOFF, Arthur H., 1st Lieut., Saugus, 182d Infantry.
COLLINS, James F., 1st Lieut., Gloucester, 101st Medical Regiment, Camp Edwards, Mass.
CRUFF, Frederick E., Captain, Boston, 101st Observation Squadron.
CURRIER, Donald E., Major, Cambridge, State Staff.
de MARCO, Joseph, Jr., Captain, Worcester, 101st Medical Regiment, Camp Edwards, Mass.
DENNEN, Ralph Waite, Major, Waltham, 182d Infantry.
FISH, James E., Major, Boston, 101st Medical Regiment, Camp Edwards.
FLASCHNER, Ira, 1st Lieut., Boston, 101st Infantry, Camp Edwards.
FRIEND, Dale G., Captain, Boston, 101st Med. Regt., Camp Edwards.
GOODWIN, Paul, Major, Medford, 180th Field Artillery.
GURHAN, Leon K., Captain, Lynn, 182d Infantry.
HARRINGTON, Philip V., 1st Lieut., Worcester, 181st Infantry, Camp Edwards, Mass.
HURLEY, Daniel J., Lieut. Colonel, Boston, 101st Medical Regiment, Camp Edwards, Mass.
HYATT, Gilbert T., Captain, Fall River, 241st Coast Artillery, Fort Andrews, Mass.
KEENAN, James A., Major, Boston, 101st Infantry, Camp Edwards.
LE BEAUX, Lincoln, 1st Lieut., Worcester, 181st Inf., Camp Edwards.
MAC KILLOP, John A., 1st Lieut., Cambridge, 102d Field Artillery.

MARTINSON, Melvin S., 1st Lieut., Worcester, 101st Medical Regiment, Camp Edwards, Mass.
MC KOAN, John W., Jr., Major, Worcester, 181st Inf., Camp Edwards.
MC LEOD, Melvin S., Captain, Boston, 241st Coast Artillery, Fort Andrews, Mass.
McQUADE, Lewis S., Major, Boston, 102d Field Artillery.
MONROE, Noel G., Major, Newton, 101st Field Artillery.
MORRISON, Norman B., Major, Brookline, 101st Quartermaster Regt.
PEAL, Stanley, 1st Lieut., Worcester, 101st Med. Regt., Camp Edwards.
REARDON, Edward R., 1st Lieut., Boston, 101st Medical Regiment, Camp Edwards, Mass.
REID, Howard S., Major, Cohasset, 101st Med. Regt., Camp Edwards.
RONKA, Ensio K., Major, Quincy, 101st Med. Regt., Camp Edwards.
SALMON, Charles A., Major, Worcester, 101st Medical Regiment, Camp Edwards, Mass.
STALK, Theodore, 1st Lieut., Egypt, 101st Med. Regt., Camp Edwards.
SWEETSER, Peter W., 1st Lieut., Caribou, Me., 104th Infantry, Camp Edwards, Mass.
THOMAS, Edwin B., 1st Lieut., Cataumet, 101st Medical Regiment, Camp Edwards, Mass.
VERNON, Hollis E., 1st Lieut., Webster, 181st Inf., Camp Edwards.
VROOMAN, Earle M., Major, North Adams, 104th Inf., Camp Edwards.
WALSH, Francis X., 1st Lieut., Boston, Special Troops, 36th Division.
WHELAN, Edmund L., 1st Lieut., Malden, 182d Infantry.
WOLK, Eliot, Captain, Boston, 101st Med. Regt., Camp Edwards, Mass.
YENS, Otto C., Captain, Cambridge, 102d Field Artillery.

MICHIGAN

ADAMS, Ralph W., 1st Lieut., Detroit, 182d Field Artillery, Fort Wood.
BIERY, Martin L., 1st Lieut., Detroit, 107th Medical Regiment, Camp Beauregard, La.
BOET, John T., Captain, Grand Rapids, 126th Inf., Camp Beauregard.
BRANCHEAU, Lynus T., 1st Lieut., New Boston, Special Troops, 32d Division, Camp Beauregard, La.
BROWN, Marion G., 1st Lieut., Detroit, 182d Field Artillery, Fort Wood.
BUCK, John D., Colonel, Detroit, 107th Med. Regt., Camp Beauregard.
BURT, Charles W., Capt., Detroit, 107th Med. Regt., Camp Beauregard.
CARPENTER, William S., Captain, Detroit, 182d Field Artillery, Fort Leonard Wood, Mo.
CLARKE, Niles A., Captain, New Boston, 107th Medical Regiment, Camp Beauregard, La.
DAVIS, Lindon L., Captain, Detroit, 210th Coast Artillery.
DAVIS, William I., 1st Lieut., Detroit, 182d Field Artillery, Fort Wood.
DE MEULENAERE, John C., 1st Lieut., Detroit, 107th Medical Regiment, Camp Beauregard, La.
FRANTZ, Charles H., Major, Grand Rapids, 126th Infantry, Camp Beauregard, La.
FURLONG, Harold A., Lieut. Colonel, Pontiac, State Staff.
HANNA, Carl, Lieut. Colonel, Detroit, 107th Medical Regiment, Camp Beauregard, La.
LADD, Graham B., 1st Lieut., Detroit, 107th Engin., Camp Beauregard.
LAMMY, James V., Major, Detroit, 107th Med. Regt., Camp Beauregard.
LEPSTO, Victor Elias, Jr., 1st Lieut., Detroit, 177th Field Artillery.
MARSH, Roland G., Major, Tecumseh, 107th Medical Regiment, Camp Beauregard, La.
MC COLL, Charles W., 1st Lieut., Wyandotte, 107th Medical Regiment, Camp Beauregard, La.
MILLER, Kenneth T., Captain, Detroit, 177th Field Artillery.
NIGG, Herbert L., 1st Lieut., Detroit, 177th Field Artillery.
PATTERSON, Robert A., 1st Lieut., Detroit, 107th Medical Regiment, Camp Beauregard, La.
PRATT, Lawrence A., Captain, Detroit, 210th Coast Artillery.
REID, John G., 1st Lieut., Detroit, 107th Engineers, Camp Beauregard.
SHAW, Milton, Lieut. Colonel, Lansing, State Staff.
SMITH, William S., 1st Lieut., Detroit, 177th Field Artillery.
SOLLER, Matthew E., Major, Ypsilanti, 107th Medical Regiment, Camp Beauregard, La.
TARTER, Clyde S., Major, Bay City, 107th Medical Regiment, Camp Beauregard, La.
VAIL, Harry F., 1st Lieut., Unionville, 107th Medical Regiment, Camp Beauregard, La.
VANDER ZALM, Theodore P., Major, Lansing, 119th Field Artillery.
WALLACE, Herbert C., Captain, Saginaw, 107th Medical Regiment, Camp Beauregard, La.
WARMENHOVEN, Simon, Captain, Grand Rapids, 126th Infantry, Camp Beauregard, La.
WELLARD, Henry C., Captain, New Baltimore, 125th Infantry, Camp Beauregard, La.
WILLSON, Wesley W., Major, Detroit, 210th Coast Artillery.
WURZ, John F., 1st Lieut., Grand Rapids, Mich., 107th Medical Regiment, Camp Beauregard, La.

MINNESOTA

ANDREASSEN, Einar C., Major, Minneapolis, 135th Infantry (R), Camp Claiborne, La.
CEPELECHA, Stanley F., Captain, Redwood Falls, 215th Coast Artillery (AA), Camp Haan, Calif.
CREIGHTON, Ralph H., Captain, Minneapolis, 135th Infantry (R), Camp Claiborne, La.
EKLUND, William J., Major, Duluth, 125th Fld. Artillery, Camp Claiborne.
HAMLON, John S., Capt., St. Charles, 135th Inf. (R), Camp Claiborne.
HULLSJEK, Richard B., Lieut. Colonel, St. Paul, MD State Staff.
JACOBSON, Wyman E., Captain, Minneapolis, 135th Infantry (R), Camp Claiborne, La.
JOHNSON, Vilhelm M., Capt., Dawson, 135th Inf. (R), Camp Claiborne.
JOHNSON, Youbert T., Major, Minneapolis, 109th Obs. Squadron.
JONES, Herbert W., Jr., Captain, Minneapolis, 151st Field Artillery, Camp Claiborne, La.
KARN, Jacob F., Captain, St. Paul, 138th Infantry.

LEITSCHUH, Linus F., 1st Lieut., Red Lake Falls, 217th Coast Artillery (AA).
LYON, John D., Jr., Captain, Minneapolis, 151st Field Artillery, Camp Claiborne, La.
SAMUELSON, Leopold G., Major, Mankato, 218th Coast Artillery (AA).
SCHMIDT, George F., Lieut. Colonel, Minneapolis, 151st Field Artillery, Camp Claiborne, La.
STRATTE, Alf K., Captain, Pine City, 125th Field Artillery, Camp Claiborne, La.
URBERG, Sofus E., Capt., Duluth, 125th Fld. Artillery, Camp Claiborne.
WILLIAMSON, George A., Major, St. Paul, 216th Coast Artillery (AA), Camp Haan, Calif.
WOLFE, Howard H., Captain, St. Paul, 216th Coast Artillery (AA), Camp Haan, Calif.

MISSISSIPPI

ARMSTRONG, James H., Captain, Oxford, 106th Quartermaster Regiment, Camp Blanding, Fla.
BAINES, Thomas A., Captain, Jackson, 106th Medical Regiment.
BOLTON, Eldon L., Capt., Biloxi, 114th Field Artillery, Camp Blanding.
BUSH, Eugene A., Captain, Laurel, 106th Med. Regt., Camp Blanding.
DORRIS, Henry C., Captain, Winona, 155th Infantry, Camp Blanding.
EUBANKS, George W., Major, Greenville, 114th Field Artillery, Camp Blanding, Fla.
FOX, James H., Major, Jackson, 106th Engineers.
HAND, Benjamin F., 1st Lieut., Greenville, 114th Field Artillery, Camp Blanding, Fla.
HUDSON, Lawrence B., Jr., Captain, Hattiesburg, 106th Medical Regiment, Camp Blanding, Fla.
JENKINS, Charles R., Captain, Ellisville, 106th Medical Regiment, Camp Blanding, Fla.
JOHNSTON, Walter E., Captain, Vicksburg, 155th Inf., Camp Blanding.
KENDALL, Nathan F., Captain, Jackson, 155th Infantry, Camp Blanding.
LAMB, Roland D., 1st Lieut., Columbus, 114th Field Artillery, Camp Blanding, Fla.
LONG, Lawrence W., Major, Jackson, State Staff.
McCALIP, Hugh L., Major, Yazoo City, 106th Quartermaster Regiment, Camp Blanding, Fla.
McDILL, John E., Major, Jackson, 106th Med. Regt., Camp Blanding.
NOBLIN, William E., Jr., Captain, Jackson, 135th Infantry.
PURSER, Thomas, Jr., Captain, McComb, 106th Quartermaster Regiment, Camp Blanding, Fla.
RAMSAY, Frank L., Captain, Laurel, 106th Med. Regt., Camp Blanding.
RAY, Robert B., Captain, Kosciusko, 185th Inf., Camp Beauregard, La.
SIMPSON, Rufus K., 1st Lieut., Macon, 106th Medical Regiment, Camp Blanding, Fla.
SMITH, Robert W., Major, Canton, 155th Infantry, Camp Blanding, Fla.
WILLIAMS, Howard S., Jr., Captain, Jackson, 106th Medical Regiment, Camp Blanding, Fla.

MISSOURI

BARNES, Seth S., Captain, Owensville, 140th Infantry.
CLARK, Ray A., Captain, Kansas City, 110th Engineers, Camp Robinson.
DIMOND, Edgar A., Captain, Muskogee, Okla., 203d Coast Artillery (AA), Camp Hulen, Texas.
GALEOTA, William R., Captain, Maryville, 128th Field Artillery, Fort Jackson, S. C.
GIST, William L., Lieut. Colonel, Kansas City, State Staff.
HARWELL, James L., Captain, Poplar Bluff, 140th Infantry.
LEECH, Charles A., Jr., Captain, Columbia, 128th Field Artillery, Fort Jackson, S. C.
LIMBAUGH, Walter R., Major, Hayti, 140th Infantry.
LUNDGREN, Fred H., Jr., Captain, Fayette, 138th Inf., Camp Robinson.
McRAVEN, Claude, Captain, Marston, 140th Infantry.
PANETTIERE, Andrew H., 1st Lieut., St. Joseph, Special Troops, 35th Division, Camp Joseph T. Robinson, Ark.
PEUGNET, Hubert B., Captain, St. Louis, 138th Inf., Camp Robinson.
SCHAEFFER, Hans, Lieut. Colonel, Kansas City, State Staff.
SILSBY, Don J., Captain, Mount Vernon, 203d Coast Artillery (AA), Camp Hulen, Texas.
SIMMONS, Leroy, Major, Sarcoux, 203d Coast Artillery (AA), Camp Hulen, Texas.
STACY, Winton T., Captain, St. Joseph, Special Troops, 35th Division, Camp Joseph T. Robinson, Ark.
STONE, William E., Major, Boonville, 128th Fld. Artillery, Fort Jackson.
TINDALL, Robert N., 1st Lieut., Coon Rapids, Ia., 138th Infantry, Camp Joseph T. Robinson, Ark.
TOLLE, Cecil E., Major, Overland Park, Kan., 110th Engineers, Camp Joseph T. Robinson, Ark.
WADE, Frederick E., 1st Lieut., Kansas City, 110th Engineers, Camp Joseph T. Robinson, Ark.
WEINER, David O., Capt., Maspeth, N. Y., 138th Inf., Camp Robinson.
WHITE, Harvey L., Major, St. Louis, 138th Infantry, Camp Robinson.

MONTANA

CRAGO, Felix H., Captain, Great Falls, 116th Medical Regiment, Fort Lewis, Wash.
HOLCOMB, Mark D., 1st Lieut., Whitefish, 163d Infantry, Fort Lewis.

NEBRASKA

AINLAY, George W., Capt., Fairbury, 110th Med. Regt., Camp Robinson.
ANDERSON, James B., Major, Lincoln, 110th Medical Regiment, Camp Joseph T. Robinson, Ark.
ANDERSON, Ronald C., Major, Columbus, 110th Medical Regiment, Camp Joseph T. Robinson, Ark.
ATTWOOD, Norman H., Capt., Omaha, 134th Inf. (R), Camp Robinson.
BARTHOLOMEW, Philip H., Colonel, Lincoln, 110th Medical Regiment, Camp Joseph T. Robinson, Ark.
BROOKS, Earl B., Lieut. Colonel, Lincoln, 110th Medical Regiment, Camp Joseph T. Robinson, Ark.

EVANS, Carroll D., Captain, Columbus, State Staff.
EVANS, James N., Major, Columbus, 110th Med. Regt., Camp Robinson.
HOBBS, Elmer T., 1st Lieut., Lincoln, 110th Medical Regiment, Camp Joseph T. Robinson, Ark.
HUBER, Paul J., Captain, Exeter, 110th Med. Regt., Camp Robinson.
INGHAM, Charles G., 1st Lieut., Norfolk, 110th Medical Regiment, Camp Joseph T. Robinson, Ark.
JOHNSON, Robert W., Capt., Lincoln, 110th Med. Regt., Camp Robinson.
JOHNSON, Rodney K., Major, Friend, 110th Medical Regiment, Camp Joseph T. Robinson, Ark.
KUNKEL, Lloyd N., Captain, Weeping Water, 110th Medical Regiment, Camp Joseph T. Robinson, Ark.
MATSON, Roy M., 1st Lieut., Holdrege, 110th Medical Regiment, Camp Joseph T. Robinson, Ark.
MERIDETH, John A., Major, Lincoln, 110th Medical Regiment, Camp Joseph T. Robinson, Ark.
MOSSMAN, Frank D., 1st Lieut., Omaha, 134th Infantry (R), Camp Joseph T. Robinson, Ark.
OPPEN, Ralph L., 1st Lieut., Omaha, 134th Inf. (R), Camp Robinson.
SALTER, George B., Captain, Norfolk, 110th Medical Regiment, Camp Joseph T. Robinson, Ark.
SHAW, Wilfred L., Capt., Hastings, 110th Med. Regt., Camp Robinson.
SHRECK, Horace W., Captain, Holdrege, 110th Quartermaster Regiment, Camp Joseph T. Robinson, Ark.
TEPLEY, Gene L., 1st Lieut., Howells, 110th Medical Regiment, Camp Joseph T. Robinson, Ark.
TOWNLEY, Robert H., 1st Lieut., Omaha, 134th Infantry (R), Camp Joseph T. Robinson, Ark.

NEVADA

HOOD, Dwight L., Major, Reno, State Staff.

NEW HAMPSHIRE

BARTON, Donald G., Captain, Concord, 197th Coast Artillery (AA), Camp Hulen, Texas.
BREMNER, Robert M., 1st Lieut., Manchester, 172d Field Artillery, Camp Blanding, Fla.
DAHLGREN, Carl A., Major, Concord, 197th Coast Artillery (AA), Camp Hulen, Texas.
FISKE, Reginald E., Major, Manchester, 172d Field Artillery, Camp Blanding, Fla.
GALLOWAY, Raymond P., 1st Lieut., Pembroke, 197th Coast Artillery (AA), Camp Hulen, Texas.
HALLISEY, Dennis L., Captain, Nashua, 172d Field Artillery, Camp Blanding, Fla.
KAPOPOULOS, Garifalos J., Major, Manchester, 172d Field Artillery, Camp Blanding, Fla.
WHEELER, John S., 1st Lieut., Concord, State Staff.

NEW JERSEY

CANUSO, Nicholas A., 1st Lieut., Camden, 114th Inf., Fort Dix, N. J.
CLUNAN, Ambrose P., 1st Lieut., Trenton, 119th Med. Regt., Fort Dix.
CORSON, Kenneth E., Captain, Vineland, 157th Field Artillery.
COTTON, Henry A., Jr., Capt., Trenton, 119th Med. Regt., Fort Dix.
CUNNINGHAM, Charles, Jr., Major, Vineland, 165th Field Artillery, Fort Dix, N. J.
De FUSCO, Gaetano T., Capt., Jersey City, 122d Separate Battalion, Coast Artillery, (AA) Fort Du Pont, Del.
ELIAS, Elmer J., Captain, Trenton, 119th Med. Regt., Fort Dix, N. J.
ENION, George A., Colonel, Sea Girt, 119th Med. Regt., Fort Dix, N. J.
FINEGAN, Paul J., Major, Trenton, Medical Department, State Staff.
FLAHERTY, Edward M., 1st Lieut., Jersey City, 119th Quartermaster Regiment.
FRANZONI, Andrew E., Capt., Trenton, 119th Med. Regt., Fort Dix.
FRAZEE, William H., Jr., 1st Lieut., Toms River, 119th Medical Regiment, Fort Dix, N. J.
GILLIGAN, Walter W., 1st Lieut., Nutley, Special Troops, 44th Division.
GRANGER, James R., 1st Lieut., Trenton, 372d Infantry.
GROESCHEL, August H., Capt., Sussex, 102d Cav., Fort Jackson, S. C.
HOFER, William R., 1st Lieut., Audubon, 114th Inf., Fort Dix, N. J.
HORLAND, Aaron H., Captain, Newark, 119th Observation Squadron.
HOWELL, Thomas W., Capt., Belleville, 102d Cav. Fort Jackson, S. C.
KRAUT, Arthur M., Captain, Jersey City, 113th Inf., Fort Dix, N. J.
LEVINE, David B., Major, Paterson, 113th Infantry, Fort Dix, N. J.
MC CARTHY, William P., 1st Lieut., Trenton, 119th Medical Regiment, Fort Dix, N. J.
MICHELSON, Henry, Captain, Paterson, 113th Inf., Fort Dix, N. J.
NEIMAN, Watson E., Capt., Point Pleasant, 114th Inf., Fort Dix, N. J.
O'GORMAN, William D., 1st Lieut., Greystone Park, 112th Field Artillery, Fort Bragg, N. C.
PEPE, Salvatore A., 1st Lieut., Trenton, 119th Med. Regt., Fort Dix.
PIERSON, Joseph R., Capt., Hopewell, 119th Med. Regt., Fort Dix, N. J.
SMITH, Byron J., Major, Newark, 102d Cavalry, Fort Jackson, S. C.
STILLMAN, Eugene H., Major, Haddonfield, 157th Field Artillery.
STORACI, Frank S., Capt., Trenton, 119th Med. Regt., Fort Dix, N. J.
WALSH, Thomas J., Major, Trenton, 119th Med. Regt., Fort Dix, N. J.
WAYMAN, Bernard R., Capt., Trenton, 119th Med. Regt., Fort Dix.
WILSON, Lester R., Major, Camden, 114th Infantry, Fort Dix, N. J.
WYLLY, Martin D., 1st Lieut., Englewood, 104th Engineers, Fort Dix.
YAEGER, Leslie A., Lieut. Colonel, Trenton, 119th Med. Regt., Fort Dix.

NEW MEXICO

COLVARD, George T., Major, Deming, 200th Coast Artil., Ft. Bliss, Tex.
HOOVER, Thomas B., Captain, Tucumcari, 104th Anti-Tank Battalion, Fort Sam Houston, San Antonio, Texas.
LONG, Julian O., Captain, Albuquerque, 200th Coast Artillery, Fort Bliss.
RILEY, Richard M., Captain, Albuquerque, 205th Coast Artillery (AA), Fort Bliss, Texas.

(To be continued)

SCHOOL OF AVIATION MEDICINE

Another course of instruction to qualify medical officers as aviation medical examiners began at the School of Aviation Medicine, Randolph Field, Texas, on July 1. The course will continue for three months. The names of the officers enrolled, together with the stations to which they are assigned, follows:

ADLER, Morton W., 1st Lieut., Fort Leonard Wood, Mo.
BAER, Erwin J., 1st Lieut., Pendleton Air Base, Pendleton, Ore.
BARRETT, Maurice E., 1st Lieut., Randolph Field, Texas.
BEIL, Martin C., 1st Lieut., McChord Field, Wash.
BENJAMIN, Edwin G., 1st Lieut., Fort Sam Houston, Texas.
BENSON, George B., 1st Lieut., Fort Benning, Ga.
BLOUNT, Lester L., 1st Lieut., March Field, Riverside, Calif.
BRENNER, William R., 1st Lieut., Hamilton Field, Calif.
BROWN, Andrew P., 1st Lieut., Fort Riley, Kan.
BROWN, Charles H., 1st Lieut., Air Base, Fresno, Calif.
BROWN, John Z., Jr., 1st Lieut., Fort George Wright, Wash.
BROWN, William E., 1st Lieut., Orlando Air Base, Orlando, Fla.
BURNS, John K., 1st Lieut., Fort Lewis, Wash.
BURT, Charles W., Captain, Camp Livingston, La.
CAMPBELL, Clayton C., Jr., 1st Lieut., Air Corps Training Detachments, Ontario, Calif.
CARBONE, Ralph, 1st Lieut., Camp Livingston, La.
CHILDS, Wallace E., 1st Lieut., Fort Knox, Ky.
CLARK, Doyce M., 1st Lieut., Fort Sill, Okla.
COLEMAN, Robert R., 1st Lieut., Alabama Institute of Aeronautics, Tuscaloosa, Ala.
COLQUITT, Alfred O., Jr., 1st Lieut., Advanced Flying School, Selma, Ala.
CONAN, Mark E., 1st Lieut., Mitchel Field, L. I., N. Y.
CONEN, Warren J., 1st Lieut., Bowman Field, Ky.
CORGILL, Donald A., 1st Lieut., Westover Field, Mass.
CRAIN, Alfred P., 1st Lieut., Barksdale Field, La.
CRANE, James E., 1st Lieut., Randolph Field, Texas.
DAY, Roy W., Jr., 1st Lieut., Albuquerque Air Base, Albuquerque, N. M.
DAYWITT, Alvin L., Captain, Fort Sill, Okla.
DeMICHELE, Roland V., Captain, Camp Forrest, Tenn.
DENGROVE, Edward, 1st Lieut., Morrison Field, West Palm Beach, Fla.
DOAK, Alfred D., 1st Lieut., Randolph Field, Texas.
DOUGHERTY, Francis M., 1st Lieut., Camp Blanding, Fla.
DOUGHERTY, John E., 1st Lieut., Randolph Field, Texas.
EVANS, David S., 1st Lieut., Fort Benning, Ga.
FASOLDT, Lawrence O., 1st Lieut., Randolph Field, Texas.
FOX, Nathan S., Captain, Manchester Air Base, Manchester, N. H.
GAILLARD, Ernest, Jr., 1st Lieut., Camp Blanding, Fla.
GODDARD, Philip A., 1st Lieut., Bangor Air Base, Bangor, Maine.
GRANT, Charles P., 1st Lieut., Eglin Field, Valparaiso, Fla.
GROGAN, Francis R., 1st Lieut., Randolph Field, Texas.
GUENON, William A., 1st Lieut., Camp Blanding, Fla.
HALL, James B., 1st Lieut., Camp Polk, La.
HALPERIN, Louis, 1st Lieut., Fort Douglas, Utah.
HARRISON, Charles S., 1st Lieut., Bolling Field, D. C.
HARTWICK, Fred W., 1st Lieut., Goodfellow Field, San Angelo, Texas.
HELLER, Harold, 1st Lieut., Stockton Field, Calif.
HILL, Edward R., 1st Lieut., Advanced Flying School, Phoenix, Ariz.
HOERNSCHEMEYER, Joseph L., Captain, Fort Sam Houston, Texas.
HOFFMAN, Richards H., 1st Lieut., Army Air Base, Windsor Locks, Conn.
JACOBSON, Harry, 1st Lieut., Ellington Field, Texas.
JOHNSON, Cyrus C., Captain, Maxwell Field, Ala.
JONES, Warren C., 1st Lieut., Gunter Field, Montgomery, Ala.
KASLOW, Arthur L., 1st Lieut., Mather Field, Calif.
LEONE, Peter P., 1st Lieut., Camp Blanding, Fla.
LUKE, Edward A., 1st Lieut., McChord Field, Wash.
McGEE, William J., 1st Lieut., Fort Benning, Ga.
MAISLEN, Sidney E., 1st Lieut., 152d Observation Squadron, Hillsgrove, R. I.
MARCHMAN, Oscar M., Jr., 1st Lieut., Kelly Field, Texas.
MASLER, Sherman, 1st Lieut., Moffett Field, Calif.
MILLIS, Jack W., 1st Lieut., Selfridge Field, Mich.
NACHTIGALL, Henry B., 1st Lieut., Fort McClellan, Ala.
NEFF, Francis Robert, Captain, Baer Field, Fort Wayne, Ind.
OSTROVE, Lester L., 1st Lieut., Jackson Air Base, Jackson, Miss.
PEARSON, John B., 1st Lieut., Station Hospital, Fort Sam Houston, Texas.
RAPPAPORT, Irving, 1st Lieut., Cochran Field, Macon, Ga.
RAYMOND, Frank K., 1st Lieut., Chanute Field, Ill.
RICE, Albert J., 1st Lieut., Randolph Field, Texas.
RICHARDSON, George S., 1st Lieut., Fort Bliss, Texas.
RICHARDSON, Guy C., Captain, Fort McClellan, Ala.
ROBINSON, Harold A., Captain, Scott Field, Ill.
ROSENBLUM, Earl I., 1st Lieut., Will Rogers Field, Okla.
RYAN, Bert M., Captain, Kelly Field, Texas.
ST. CLAIR, Alexander A., 1st Lieut., Middletown Air Depot, Middletown, Pa.
SCHLESINGER, Henry A., 1st Lieut., MacDill Field, Fla.
SCHWEITZER, Martin, 1st Lieut., Baton Rouge Air Base, La.
SHAPIRO, Lester, 1st Lieut., Meridian Air Base, Meridian, Miss.
SHEA, Andrew W., 1st Lieut., Scott Field, Ill.
SIMMANG, Arthur V., 1st Lieut., Brooks Field, Texas.
SMITH, George L., 1st Lieut., Mississippi Institute of Aeronautics, Jackson, Miss.
SMOLENS, Nathan M., Captain, Air Base, Tucson, Ariz.
SOHMER, Abram, 1st Lieut., Savannah Air Base, Savannah, Ga.
SPEED, Henry K., 1st Lieut., Lowry Field, Colo.
SPRONG, Aaron A., 1st Lieut., Fort Leonard Wood, Mo.

TAKSA, David S., 1st Lieut., Tallahassee Air Base, Tallahassee, Fla.
THOMPSON, Frank V., 1st Lieut., Langley Field, Va.
VANNETER, James C., Captain, Recruiting Service, Fort Hayes, Columbus, Ohio.
VOSS, Bernard J., 1st Lieut., March Field, Calif.
WHITLOW, Joseph E., Major, McChord Field, Wash.
WIER, David T., 1st Lieut., Kelly Field, Texas.
WILLIGER, Irwin F., 1st Lieut., Patterson Field, Ohio.
WILUCKI, Melvin R., 1st Lieut., Adams Field, Little Rock, Ark.

MORE NEW NAVY MEDICAL OFFICERS

The following candidates were issued appointments as Acting Assistant Surgeons for intern training in the Medical Corps in the Navy, with rank of Lieutenant (junior grade), to rank from the dates indicated:

TO RANK FROM JUNE 25

BALLENBERGER, Louis P., Hamlet, N. C.
BERGMAN, George R., Los Angeles.
COLE, Clifford B., Somerville, Tenn.
EDGAR, Erwood G., Toledo, Ohio.
EMMETT, John E., New York.
FOCHTMAN, Thomas W., Petoskey, Mich.
FREITAS, Eugene L., Detroit.
GERBER, Marvin L., Menlo Park, Calif.
HANSEN, Wayne S., Chico, Calif.
HAYES, Egbert Morris, Syracuse, N. Y.
JAHNKE, Leonard P., Detroit.
KIMBER, James H., Fayetteville, N. Y.
KLEY, Edward C., Long Island, N. Y.
KRAFT, Frederick W., Chicago.
LAUGHLIN, Henry P., Hagerstown, Md.
MOORE, Grover L., Portsmouth, Va.
MORDAUNT, Richard H., St. Joseph, Mo.
MORRICAL, Russell J., Logansport, Ind.
NOVA, Philip L., Detroit.
O'BRIEN, John J., Buffalo.
PARRISH, Richard K., Decatur, Ind.
SCOFIELD, Dean S., San Diego, Calif.
SEARS, David R., Palo Alto, Calif.
SHERMAN, John J., Ironton, Ohio.
SPRUNG, Charles W., Wilmington, N. C.
VIRNIG, Richard P., New Richland, Minn.

TO RANK FROM JULY 2

BRUNO, John R., Conshohocken, Pa.
GAMBLE, Donald L., Canonsburg, Pa.
FUSCO, John A., Los Angeles.
LEWIS, Gwilym B., Redlands, Calif.
PLETTA, Fred A., Berkeley, Calif.
SCHUGMANN, Robert F., Ann Arbor, Mich.

NEW NAVAL HOSPITALS

Three new naval hospitals are scheduled to open in July. The four hundred and twenty bed hospital at Corpus Christi, Texas, which will primarily serve the new naval air station, will be in charge of Capt. W. L. Mann, M. C., and the four hundred bed hospital at Jacksonville, Fla., which also will primarily serve a naval air station, will be in charge of Capt. Lester L. Pratt, M. C. The new one hundred and thirty bed hospital at Quantico, Va., will give the marine barracks at that station a hospital equipped to care for many of the cases which now must go to Washington, D. C.

VITAMIN TABLETS FOR SOLDIERS

The War Department announced, July 11, that U. S. Army troops serving in far northern climates will have vitamin tablets included in their daily rations as protection against nutritional diseases. The Surgeon General's Office in collaboration with the National Research Council has authorized the issue of two multiple vitamin tablets or capsules daily for every soldier serving in arctic regions. The tablets will contain vitamins A, B₁, B₂, C and D and nicotinic acid compound.

ARMY GENERAL HOSPITAL AT DANVILLE, KY.

The War Department announced, July 11, the award of a contract covering the construction of a two hundred and fifty bed general hospital unit at Danville, Ky., at an estimated cost of \$330,943. The unit will be located adjacent to the newly constructed hospital facilities being leased at a nominal rental from the commonwealth of Kentucky.

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—S. 1569 has passed the Senate, providing for the termination of leases covering property occupied for professional, business, agricultural or similar purposes where any such lease has been or may be executed on his own behalf by any person who is or may hereafter be in military service by virtue of the provisions of the Selective Training and Service Act or the Public Resolution authorizing the President to call out the reserve units.

Bills Introduced.—H. R. 4986, introduced by Representative Welch, California, proposes to amend the Longshoremen's and Harbor Workers' Compensation Act. Among other changes proposed, the pending bill would provide for the establishment of panels "of qualified physicians, surgeons, specialists, consultants, laboratory x-ray or other technicians, compensation

medical bureaus and laboratories" and would authorize an injured employee to "select to treat him any physician authorized by the Commission to render medical care." The commission would furthermore be authorized to establish schedules of fees to be charged for services rendered to injured employees. H. R. 5236, introduced by Representative Buckler, Minnesota, proposes to grant pensions to certain soldiers, sailors and marines who served in the Pulajane and Moro campaigns and other uprisings in the Philippine Islands from July 16, 1903 to Dec. 31, 1913. The bill provides that the same privileges of hospitalization and medical care and treatment accorded to honorably discharged veterans of the Spanish-American War, the Philippine Insurrection, Boxer Rebellion and World War shall be extended to honorably discharged veterans of the Pulajane and Moro campaigns.

MEDICAL ECONOMIC ABSTRACTS

ILLNESS AND ACCIDENTS IN RELATION TO HOUSING CONDITIONS

The United States Public Health Service continues to analyze the results of the National Health Survey in relation to various factors.¹ It is assumed that this survey gave an accurate picture of morbidity. The illnesses so reported have been distributed according to the degree of overcrowding into three classifications. The distribution of the population within these classifications was as follows:

	Per Cent
A. One person or less per room.....	74.9
B. More than 1 person per room but not more than 1½..	16.7
C. More than 1½ persons per room.....	8.3
	100.0

Those with an income above the \$1,500 level appear to have been eliminated, and "attention is centered upon the lower income groups." The comment on the results of the analysis is as follows:

The inferences to be drawn from this material must necessarily be somewhat speculative in nature, because of the extreme intricacy of the whole question of the relation between housing and health.

The many complicating factors the effect of which cannot be eliminated satisfactorily—differences of income, of race, of educational and intelligence level, and of housekeeping efficiency, to name but a few—constitute a serious limitation on the interpretation of the data. The most serious limitation perhaps lies in the element economic status. Sometimes disease or impairment cuts down income or prevents entirely the earning of a livelihood and so forces families into poor housing, the only kind they can afford. Sometimes low income causes or perpetuates disease by making impossible an adequate diet, proper medical care (at home or in institutions) and other essentials of healthful living. With low income often goes exposure to unhealthful occupations. As a consequence of these inextricably interwoven factors, persons badly housed have excessive rates of illness and mortality quite apart from the influence of the housing conditions themselves.

In this report an attempt has been made to eliminate the effect of economic differences by making comparisons within certain broad income classes; but it is apparent that, within each of these classes, differences in effective income with degree of crowding, together with a tendency for families overburdened by disease to drift into the crowded households, have prevented the complete isolation of the effect of housing itself. In fact, it may be stated categorically that no conclusion as to the precise role of housing per se in the illness experience of low income families is possible from the material presented in this report, or indeed from any data now available. This statement is not to be interpreted as meaning that bad housing does not affect health. It is well recognized that there are certain essentials of a healthful home environment—a sufficient supply of pure water, sanitary sewage disposal, sufficient ventilation, heat and light, space enough for ordinary family living, absence of excessive dampness, screening against mosquitoes and flies, freedom from fire and other accident hazards, adequate playgrounds and sunshine for children. Health is more than the mere absence of outright disease; it is a state of being in which all physical and mental processes approach their highest efficiency. That is possible only under satisfactory conditions of housing.

Despite the impossibility of assessing the precise effect of housing conditions, this report has established an important broad association between housing and health. Illness rates were found to be higher in congested households, especially for certain diagnoses; disabling digestive diseases were substantially more frequent in households not having a private inside flush toilet; and serious home accidents rose with drop in rental. Essentially, because of the interrelated nature of the indices, this association is to be regarded as one between illness and poor housing generally. What has been demonstrated most clearly is that this excess illness rate, to whatever extent it is due to bad housing itself, occurs in the low income, poorly housed populations, who are least able to meet the burden of disease.

COMMUNITY MEDICAL CARE, INC., OF NEW YORK

A new nonprofit medical indemnity corporation called Community Medical Care, Inc., received a permit from the New York State Department of Insurance on June 4. According to an announcement by Dr. S. S. Goldwater, president of the Associated Hospital Service of New York, this new contributory plan will provide hospital ward service and all the medical service needed for satisfactory clinical treatment for workers with limited incomes and their dependents. It will be managed by a board of directors, under the presidency of Dr. I. Ogden Woodruff, consisting of sixteen physicians and eight laymen. Six of these physicians are former presidents of county medical societies in Greater New York.

The plan has been approved in principle by a special committee of the coordinating council of five county medical societies of Greater New York and by the State Insurance Department and the Department of Social Welfare.

This new plan will offer ward hospital service for \$6 per annum for individuals and \$13.50 for families. Additional payments of the same amount to the Community Medical Care, Inc., will cover medical fees. The rates for combined hospital and all necessary medical care during the subscriber's hospital stay will therefore be \$12 per annum for individuals and \$27 per annum for families including all children under 18 years.

The plan will be limited to single persons with incomes of \$1,200 or less, but subscriptions providing maternity care as well as general medical and surgical service will be available to husbands and wives with combined incomes of \$1,680 and to families including children with incomes of \$2,100 or less.

Hospital service and medical care will be offered only under a combined contract. Administrative expenses will be shared by the Associated Hospital Service and Community Medical Care. Subject to hospital rules, subscribers will have free choice among participating hospitals in which subscribers' physicians now have, or may hereafter acquire, the privilege of caring for patients. It is expected that this provision will lead to an increase of private and semiprivate courtesy staffs.

1. Britten, R. H., and Altman, Isidore: Illness and Accidents Among Persons Living Under Different Housing Conditions. Pub. Health Rep. 56: 609 (March 28) 1941.

Medical News

MEDICAL NEWS

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

Jour. A. M. A.
July 26, 1941

ALABAMA

Society News.—The Northwestern division of the state medical association was addressed in Moulton, June 26, among others, by Drs. Andrew L. Glaze, Birmingham, on "Prophylactic Treatment of Acne Vulgaris" and William N. Jones, Birmingham, "Cancer of the Female Reproductive Organs." **Personal.**—Dr. Iva G. Murphy, Eutaw, has been appointed health officer of Greene County. Dr. Elisha M. Moore, Centerville, is now health officer of Sumter County. Dr. John E. Garrison has resigned as chief of staff and chief of the obstetric and gynecologic departments of the Salvation Army Home and Hospital, Birmingham, after twenty-nine years' service. He will continue to serve the hospital in an emeritus capacity. Dr. Rutherford O. Ingham, Athens, has resigned as health officer of Limestone County to accept a similar position in Johnson City, Washington County, Tenn. Dr. Frank M. Hall, Athens, who has been on leave of absence doing graduate work at Johns Hopkins University, will return as health officer of Limestone County. Dr. Mary Walton, Opelika, has been named health officer for Chilton County, succeeding Dr. Robert W. Crowell, Clanton.

CALIFORNIA

Society News.—Dr. Logan Clendening, Kansas City, Mo., discussed "Some Memorials of Medicine in America" before the Hollywood Academy of Medicine, July 10. A symposium on fluid therapy was presented by Drs. James B. Graesser, Paul P. E. Michael, Olin H. Garrison and Arthur J. Hunnicutt before the Alameda County Medical Association in Oakland, June 16.

Memorial Blood Bank Opened.—The Irwin Memorial Blood Bank of the San Francisco County Medical Society opened, June 17, and its services are now available for local as well as war relief purposes. The Blood Bank Commission welcomes donors at the society headquarters and especially invites physicians. On the opening day many prominent persons of San Francisco and Oakland gave donations of blood, and on the following day the Junior Chamber of Commerce turned out in force for contributions. A description of the Irwin Memorial Blood Bank appeared in THE JOURNAL, April 5, page 1587.

Study of Applications of Cyclotron to Medicine.—The Columbia Foundation has given \$50,000 to the University of California, Berkeley, for the study of applications of the cyclotron to medicine. The gift will be known as the Columbia Fund for Medical Physics and will enable Berkeley scientists to intensify studies which have shown promise of providing new treatments for disease. The university will now be able to support for five years a research team of five men trained in as many fields, \$10,000 to be allotted each year, effective immediately. Dr. John H. Lawrence, San Francisco, will be in charge of the medical investigations with the cyclotron. The Columbia Foundation was organized by a San Francisco family which prefers to remain anonymous.

COLORADO

Society News.—Dr. Gerald M. Frumess, Denver, addressed the Northeast Colorado Medical Society, June 12, in Sterling on "Treatment of Common Diseases of the Skin." Drs. Whitney C. Porter and Rex L. Murphy, Denver, addressed the Northwestern Colorado Medical Society in Steamboat Springs, May 29, on "Treatment of Industrial Eye Injuries" and "Management of Sinus Infections" respectively. Dr. Robert J. Groom, Grand Junction, discussed "Artificial Immunization in Childhood" at the May meeting of the Mesa County Medical Society, in Fruita. Dr. Douglas W. Macomber, Denver, addressed the San Luis Valley Medical Society in Alamosa, June 17, on "Wound Healing and the Practical Application of Skin Grafting."

New Units at Glickner Hospital.—Recent additions to the Glickner Sanatorium and Hospital, Colorado Springs, include a new nurses' home and an aniseikonia laboratory. The nurses' home is the gift of Mrs. Verner Z. Reed of Denver in memory of her daughter, Marjorie Reed, who during the first World War studied Red Cross nursing under the

auspices of the hospital. It is a three story brick structure, containing rooms for one hundred and twenty-seven nurses, a solarium, an auditorium with a capacity for two hundred and fifty persons, four small parlors, a large music room, a library, a small private chapel, and other modern conveniences and facilities. The aniseikonia laboratory is under the direction of Dr. Von Haller Brobeck and is one of about ten that are now being planned throughout the country.

ILLINOIS

Personal.—Dr. Philip S. Waters, Alton, has been appointed acting managing officer of the Peoria State Hospital, Peoria, succeeding Dr. Bernard Skorodin, who has been acting manager. Dr. Waters once served as managing officer of the Lincoln State School and Colony.

Society News.—Recently elected officers of the Illinois Psychiatric Society include Drs. Walter H. Baer, Manteno, president; Paul L. Schroeder, Chicago, vice president, and Eugene I. Falstein, Chicago, secretary. Dr. Leo K. Campbell, Chicago, discussed "Management of Emergencies in Diabetics" before the Lake County Medical Society in May.

CHICAGO

Course in Electrocardiography.—The cardiovascular department of Michael Reese Hospital is offering a two weeks course in electrocardiography, August 18-30, under the direction of Dr. Louis N. Katz. Additional information may be secured from the hospital.

Will Provides for Scientific Research.—Under the will of George Herbert Jones, one of the founders of the Inland Steel Company, about \$1,000,000 has been set aside to "promote scientific research to alleviate human suffering, improvement of living and working conditions, improvement of facilities for recreation, and improvement of hygiene and prevention of disease, and to assist care of children, the sick, aged, and helpless; reformations of victims of alcohol and narcotics, ex-convicts and wayward persons, and to facilitate work in social and domestic hygiene." The will directs that the income and not more than 10 per cent of the principal are to be disbursed by the Chicago Community Trust to charities and educational institutions which "best make for the mental, moral, intellectual and physical improvement" of residents of the state. Mr. Jones during his lifetime gave about \$4,000,000 to education and medicine.

Investigation of Outbreak of Poliomyelitis.—Fifteen cases of poliomyelitis in the western suburbs of Chicago since June 26 led to the formation of a special committee to investigate the outbreak with the cooperation of the National Foundation for Infantile Paralysis. The members of the committee will be Drs. Edward A. Piszczek, health officer of Cook County, chairman; Morris Fishbein, Editor of THE JOURNAL; Hernan N. Bundesen, health commissioner; Irving S. Cutter, dean, Northwestern University Medical School; Winston H. Tucker, health officer of Evanston; Robert A. Black, chairman of the health department advisory committee of the Chicago Medical Society; Sidney O. Levinson, director of the Samuel R. Cross, Springfield, director of the state department of public health; Arthur E. Gorinan, engineer of water purification, and Howard J. Shaughnessy, Ph.D., director of laboratories for the state health department. Dr. Shaughnessy will be in charge of the investigation, for which the National Foundation for Infantile Paralysis will supply 50 monkeys from the virus research centers at Ann Arbor and Lansing, Mich. The first cases were traced to a child in Western Springs who sold lemonade to her friends. She and four of her customers acquired the disease, and the other patients in La Grange, Park Ridge, Oak Park and Berwyn were found to have had some direct or indirect contact with the original patient, it was said.

INDIANA

Changes in Health Officers.—Dr. James B. Griffith, health officer of Crawfordsville, has been appointed in charge of the Montgomery County health department, succeeding the late Dr. Fred A. Dennis. Dr. Russell P. Reynolds, Elizabethtown, has resigned as health commissioner of Bartholomew County. He will engage in the practice of medicine at Garrett, it is reported. Dr. Clint C. Sourwine, Brazil, has been made health officer of Clay County to succeed Dr. John M. Palm. Dr. Johnson, Rensselaer, has been appointed health officer of Jasper County, succeeding the late Dr. Arthur R. Kresler. Dr. Ed N. Loy, health officer of Rensselaer, has been acting health officer of the county.

IOWA

Annual Summer Meeting.—The Upper Des Moines Medical Society held its annual summer meeting at Templar Park on Spirit Lake, July 10. The speakers included:

- Dr. Harold W. Morgan, Mason City, Pathology of Intestines.
Dr. Allan B. Phillips, Des Moines, Roentgen Diagnosis of Intestinal Conditions.
Dr. Roy W. Fouts, Omaha, Medical Preparedness.
Dr. William D. Paul, Iowa City, Common Diseases of the Lower Intestinal Tract.
Dr. John B. Erich, Rochester, Minn., Traumatic Injuries of the Face.
Dr. George H. Scanlon, Iowa City, Acute Surgical Conditions in the Abdomen.
Dr. Walter C. Alvarez, Rochester, Treatment of Nervous Indigestion.
Dr. William R. Lovelace, II, Rochester, Increased Risk of Patient Flying at High Altitude.

KENTUCKY

District Meeting.—A meeting of the Tenth Councilor District of the Kentucky State Medical Association was held in Lexington, July 17, with Drs. Rettig Arnold Griswold and Maurice G. Buckles, Louisville, as the speakers on "Compound Fractures" and "Wheeze, Cough and Hoarseness" respectively. Dr. Elmer L. Henderson, Louisville, president-elect of the state association, also made an address.

Society News.—Drs. Joseph Andrew Bowen and Jacob S. Bumgardner addressed the Jefferson County Medical Society, Louisville, June 2, on "Urology in Infancy and Childhood" and "Common Lesions of the Larynx" respectively.—Drs. Philip F. Barbour and William W. Nicholson, Louisville, recently conducted a pediatric conference as guests of the Union County Medical Society, Morganfield. Dr. Barbour discussed "Chronic Heart Disease" and "Diarrhea and Dysentery"; Dr. Nicholson's subjects were "Feeding Problems" and "Newer Drugs in the Treatment of Pneumonia."

LOUISIANA

Postgraduate Course for Negro Physicians.—The sixth annual postgraduate course for Negro physicians was presented at the Flint-Goodridge Hospital of Dillard University, New Orleans, June 16-27. Instruction was given by members of the staffs of the medical schools of Louisiana State and Tulane universities and the following guest speakers: Drs. Theodore K. Lawless, Chicago; Peter M. Murray, New York; John W. Chenault, Tuskegee Institute, Ala., and Hugh A. Browne, Alexander, Ark. Clinics, demonstrations and lectures made up the program.

MARYLAND

Personal.—Dr. John M. T. Finney, emeritus professor of surgery, Johns Hopkins University School of Medicine, Baltimore, was awarded the honorary degree of doctor of letters by Jefferson Medical College, Philadelphia, June 6, at which time Dr. Finney gave the commencement address, entitled "The True Province of the Doctor." Dr. Warfield T. Longcope, professor and director of the department of medicine at Johns Hopkins, received the degree of doctor of science from the University of Rochester, Rochester, N. Y., at the commencement exercises, June 16.

Election of Officers.—Dr. Robert Lee Hall, Pocomoke City, was elected president of the Medical and Chirurgical Faculty of Maryland at its recent meeting in Baltimore, succeeding Dr. Harvey B. Stone, Baltimore. Other officers include Drs. Maurice C. Pincoffs, Baltimore; William F. Williams, Cumberland, and Jacob W. Bird, Sandy Spring, vice presidents; Richard T. Shackelford, Baltimore, secretary, and Joseph Albert Chatard, Baltimore, treasurer. The 1942 session will be in Baltimore, April 28-30.

Sodium Fluoride Used as Insecticide Must Be Colored.—The Maryland State Board of Health adopted a regulation, May 29, requiring that insecticides containing sodium fluoride must be colored Nile blue as a warning of their poisonous nature. A recent tragedy in which white sodium fluoride was accidentally used in pancakes and killed twelve people, as well as the finding of quantities of this substance in hotel, restaurant and hospital kitchens, led to the new order. Manufacturers of insecticides and commercial fumigators have been informed of the change, and all food establishments are expected to remove the uncolored sodium fluoride from their premises.

MICHIGAN

Fraudulent Use of Diploma.—Wayne University announces that a former summer school student, Gershon Bloom, has made fraudulent use of the Wayne University seal and transcript in making application to various medical colleges. The case has been placed in the hands of the disciplinary authorities of the Detroit Public School System, of which Wayne University is a part.

Annual Alumni Clinic.—The alumni of Wayne University College of Medicine held their annual one day clinic, June 11, at the Detroit Institute of Art with the following participants:

- Dr. Charles W. Mayo, Rochester, Minn., Carcinoma of the Lower Colon and Rectum: Surgical Treatment.
Dr. William Magner, Toronto, Ont., Pathogenesis of Anemia.
Dr. Frank D. Dickson, Kansas City, Mo., Surgical Treatment of Arthritis.
Dr. Walter Lincoln Palmer, Chicago, Diagnosis and Treatment of Gastric Disease.
Dr. Philip D. Woodbridge, Boston, Recent Developments in Anesthesia.

At the banquet at the Hotel Statler in the evening Wallace R. Deuel, foreign correspondent for the Chicago *Daily News*, spoke on "The World Counter Revolution." Malcolm W. Bingay, editorial director, Detroit *Free Press*, was toastmaster.

Conference on Serology and Syphilis Control.—The American Association of Industrial Physicians and Surgeons in cooperation with the U. S. Public Health Service and the American Social Hygiene Association sponsored a conference on serology and syphilis control at the Michigan Union, Ann Arbor, June 7. The speakers included:

- Dr. George H. Gehrmann, Wilmington, Del.
Dr. Harold A. Vonachen, Peoria, Ill.
Dr. Udo J. Wile, Ann Arbor.
Reuben L. Kahn, Sc.D., Ann Arbor.
Drs. Walter M. Simpson, Herbert Worley Kendell and Donald L. Rose, Dayton, Ohio.
Dr. Earle A. Irvin, Cleveland.
Dr. Millard C. Hanson, Pittsburgh.
Dr. Otis L. Anderson, district number 3, U. S. Public Health Service.
Dr. James H. Gordon, Silver Spring, Md., captain, medical reserve corps, U. S. Army.
Rear Admiral Harold W. Smith, medical corps, U. S. Navy.
Dr. Raymond A. Vonderlehr, Washington, D. C.
Dr. John Sundwall, Ann Arbor.
Dr. Charles Walter Clarke, New York.
Dr. Clarence D. Selby, Detroit.
Dr. Cassius H. Watson, New York.

MINNESOTA

Course on Health Problems in Industry.—The Center for Continuation Study of the University of Minnesota, Minneapolis, will offer a course on health problems in industry, August 4-6, recommended for industrial nurses, physicians and welfare workers. A staff of twenty-four physicians, nurses and other workers in industrial welfare will present such topics as soft tissue injuries and fractures, hand infections and injuries, burns, heart disease, occupational dermatitis, prevention and treatment of the common cold and care of the feet. There will also be a demonstration of fatigue laboratory studies and a round table discussion of principles of first aid. At one evening meeting Drs. Jay Arthur Myers and Harry G. Irvine will discuss case finding in tuberculosis and venereal disease, respectively, and the second evening Dr. Carl M. Peterson, secretary, Council on Industrial Health of the American Medical Association, Chicago, will speak on "Benefits of an Industrial Health Program." Registration for the course is \$2 and tuition \$5.

MISSOURI

Physicians Honored.—Three physicians who had completed fifty or more years in the practice of medicine were honored at a special meeting of the St. Louis County Medical Society, June 18. The physicians are Drs. Joseph A. Prichard, Overland, William H. Townsend, Maplewood, and John W. Pickel, Kirkwood. Each was presented with a key from the society as a token of appreciation, honor and esteem for many years' service in the profession. The guest speaker was Dr. John R. Paine, Minneapolis, and his subject "Recent Advances in the Study of Intestinal Obstruction."

Dr. Stewart Returns as State Health Commissioner.—Dr. James Stewart, formerly state health commissioner and for the past eight years in private practice in Jefferson City, has been again appointed to the position for a four year term, succeeding Dr. Harry F. Parker. Dr. Stewart was first named health commissioner in 1925. Prior to that he had been director of the hygiene division of the public school system in St. Louis. When his second term ended, in May 1933, Dr. Stewart returned to private practice. He was a member of the state legislature from 1905 to 1909 and served as secretary of the state board of health during his term as health commissioner.

NEBRASKA

State Medical Election.—Dr. Dexter D. King, York, was named president-elect of the Nebraska State Medical Association at the annual meeting in Lincoln in May and Dr. William P. Wherry, Omaha, was installed as president. Drs. Ted E. Riddell, Scottsbluff, and Harry W. Francis, Bancroft, were elected vice presidents. Dr. Roy B. Adams, Lincoln, continues as secretary. The 1942 meeting will be in Omaha.

NEW YORK

Society News.—Drs. William Libertson and William P. Van Wageningen, Rochester, addressed the Neuron Club at its spring meeting at the Rochester State Hospital, June 21, on "Metrazol Therapy" and "Prefrontal Lobotomy" respectively. The club, which has a membership of twenty-five psychiatrists in western New York and meets five times a year, was organized about twenty-five years ago.

School of Nutrition at Cornell.—The establishment of a school of nutrition with courses leading to the degree of master of science in nutrition was announced, June 27, by Cornell University, Ithaca. The school will offer a two year curriculum to students who have completed three years of preparatory work at the college level. In addition to training specialists the school will offer instruction to students in related fields, such as agricultural agents, conservationists, veterinarians, physiologists, toxicologists and those preparing to serve the food industries. Leonard A. Maynard, Ph.D., professor of animal nutrition at Cornell for the past twenty years and director of a nutrition laboratory established at Cornell by the U. S. Department of Agriculture in 1939, will be director of the school of nutrition. Members of the staff will be drawn from the divisions of the university most concerned with nutrition problems, it was said. Also associated with the work will be Dr. Eugene F. Du Bois, professor of physiology, and other members of the staff at Cornell University Medical College, New York, the announcement said.

New York City

Gifts to Columbia.—An anonymous donor has given \$10,000 to Columbia University College of Physicians and Surgeons for research in dermatology by Dr. A. Benson Cannon. The Josiah Macy Jr. Foundation has also made a grant of \$7,700, of which \$2,200 is to be used for a study of the health needs of a group of families and \$5,500 for a study of traumatic shock due to external injury or blow under the direction of Magnus I. Gergersen, Ph.D., professor of physiology.

Staff Changes at Rockefeller Institute.—Changes in the scientific staff of the Rockefeller Institute for Medical Research announced by the board of scientific directors include the following new appointments:

Member: Dr. Frank L. Horsfall Jr., New York.
Assistants: Drs. Frederick B. Bang, Nashville, Tenn.; Vincent P. Dole Jr., Boston; George H. Hogeboom, Baltimore, and Robert E. Shank, St. Louis.

Fellows: Drs. Robert A. Phillips and Sidney Rothbard, New York.

Promotions were announced as follows:

Associate member to member: Rene J. DuBois, Ph.D., and Dr. Rafael Lorente de No.

Assistant to associate: Lindsay M. Black, Ph.D., Dr. Jorge Casals-Ariet, Max A. Lauffer Jr., Ph.D., and David P. C. Lloyd, Ph.D.

Fellow to assistant: James A. Baker, Ph.D., Paul B. Hamilton and Margaret R. McDonald, Ph.D.

Dr. Robert F. Watson, New York, has been appointed resident physician at the hospital.

Personal.—Dr. Charles Ward G. Crampton received the Silver Buffalo of the Boy Scouts of America at the annual meeting of the National Council in Washington in May. Dr. Crampton has been an adviser of the scout organization on health matters for more than twenty-five years.—Dr. Jacob M. Gershberg, president and founder of the International Spanish Speaking Association of Physicians, was recently honored at a testimonial dinner at the Waldorf-Astoria.—Donald D. Van Slyke, Ph.D., member of the Rockefeller Institute for Medical Research, has been elected president of the American Bureau for Medical Aid to China.—Dr. Smith Ely Jelliffe has been made an honorary member of the section of neurology of the Royal Society of Medicine of England.—Dr. Karl Landsteiner, of the Rockefeller Institute for Medical Research, has been made a fellow of the Royal Society of England.

OHIO

State Medical Election.—Dr. Edward J. McCormick, Toledo, was named president-elect of the Ohio State Medical Association at the annual meeting in Cleveland, June 4, and Dr. Harry V. Paryzek, Cleveland, was installed as president. Next year's meeting will be held in Columbus.

Portrait of Dr. Sollmann.—Alumni and friends of Dr. Donald H. Sollmann, dean and professor of pharmacology and materia medica at Western Reserve University School of Medicine, Cleveland, presented a portrait of Dr. Sollmann to the school during commencement week. The names of the six hundred persons responsible for the gift were written in a leather bound book presented to Dr. Sollmann at an unveiling ceremony at the Hotel Cleveland. Dr. Sollmann is chairman of the Council on Pharmacy and Chemistry of the American Medical Association.

PENNSYLVANIA

District Meeting.—The annual meeting of the Eleventh Council District of the Medical Society of the State of Pennsylvania was held, July 10, at Johnstown. Drs. Dudley A. Irwin, Toronto, Ont., and Leo H. Cricp, Pittsburgh, were the scientific speakers on "Silicosis" and "Management of Allergic Conditions of the Respiratory Tract" respectively. Drs. Francis F. Borzell, Philadelphia, president, and Lewis T. Buckman, Wilkes-Barre, president-elect of the Medical Society of the State of Pennsylvania, were guest speakers at the afternoon session.

Philadelphia

Portrait of Dr. Arnold.—The classes of 1940 and 1941 at Temple University School of Medicine presented to the school at the June commencement a life size portrait of Dr. Jesse O. Arnold, who recently became professor emeritus of obstetrics. These were the last two classes taught by Dr. Arnold. The portrait, painted by Lazar Raditz of New York and Philadelphia, was accepted by Dr. William N. Parkinson, dean of the school, and was placed in the library.

TENNESSEE

Poliomyelitis Outbreak.—Seventeen cases of poliomyelitis have been reported in Franklin and Coffee counties, according to a newspaper dispatch July 17. Camp Forrest, a new army cantonment, is in Coffee County. No cases have been reported there.

Society News.—Drs. Walter A. Ruch and W. Likely Simpson, Memphis, addressed the Benton, Carroll, Weakley and Henry Counties Medical Society, McKenzie, June 10, on "True versus False Labor" and "Osteomyelitis of the Skull Resulting from Infection of the Sinuses" respectively.—Dr. Augustus H. Lancaster, Knoxville, addressed the Knox County Medical Society, Knoxville, June 17, on congenital syphilis.

TEXAS

Special Society Elections.—At the recent annual meetings of special societies in Fort Worth the Texas Dermatological Society elected Drs. Arthur G. Schoch, Dallas, president; William F. Spiller, Galveston, vice president, and Duncan O. Poth, San Antonio, secretary, reelected. The Texas Neurological Society elected the following officers: Drs. James Greenwood Jr., Houston, president; Giles W. Day, Fort Worth, and John A. McIntosh, San Antonio, vice presidents, and Fred Terry Rogers, Dallas, secretary. Dr. Herbert T. Hayes, Houston, was elected president of the Texas Society of Gastroenterologists and Proctologists; Drs. Hugh Beaton, Fort Worth, and Dolph L. Curb, Galveston, were named vice presidents, and Dr. Thomas E. Smith, Dallas, was reelected secretary. The Texas Heart Association elected Drs. Charles T. Stone, Galveston, president; William B. Adamson, Abilene, vice president, and Victor E. Schulze, San Angelo, secretary, reelected. The Texas Orthopedic Association elected officers as follows: Drs. Edmund M. Cowart, Houston, president; Fred A. Bloom, Houston, vice president, and Mary Ruth Jackson, Dallas, secretary. Officers of the Texas Pediatric Society are Drs. Percy E. Luecke, Dallas, president; Frank H. Lancaster, Houston, president-elect, and John E. Ashby, Dallas, secretary.

WISCONSIN

Personal.—Dr. Rock Sleyser, Wauwatosa, received the honorary degree of doctor of laws from Marquette University, Milwaukee, at the commencement, June 11.—Dr. William Gordon Winter, formerly chief resident physician of Olive View Sanatorium, Olive View, Calif., has been appointed to the staff of the Wisconsin Anti-Tuberculosis Association in Milwaukee. He succeeds Dr. Florence E. MacInnis, who recently joined the Milwaukee health department.

Meeting of Eye and Ear Specialists.—The spring meeting of the Central Wisconsin Society of Ophthalmology and Otolaryngology was held recently at Wisconsin Rapids. The speakers were:

Dr. Henry L. Williams, Rochester, Minn., Sulfamido Compounds in Acute Otitis Media, Mastoiditis and Their Complications.
Dr. Avery D. Prangen, Rochester, Significance of Sturm's Interval in Refraction.
Dr. Hedwig A. Kuhn, Hammond, Ind., Allergy in Otolaryngology.
Dr. Ferdinand H. Haessler, Milwaukee, Diagnosis of Central Nervous System Lesions.
Dr. Fred S. Cook, Eau Claire, Intracranial Foreign Bodies.
Dr. Fred Z. Havens, Rochester, Reconstructive Surgery of the Ear.
Dr. Charles N. Spratt, Minneapolis, Disease of the Nasolacrimal Duct and Treatment.

Society News.—Dr. Edgar L. Gilcreest, San Francisco, addressed the Milwaukee Society of Clinical Surgery, June 11, on "Lesions of Muscles and Tendons in General But Particularly of the Shoulder Girdle and Arm." Dr. Gervase S. Flaherty, South Milwaukee, discussed "Gangrenous Appendicitis in Children."—Drs. Lawrence R. Boies and Charles E. Stanford, Minneapolis, addressed the Barron-Washburn-Sawyer-Burnett Counties Medical Society, June 10, in Cumberland on treatment of diseases of the eye, ear, nose and throat.—Dr. Max J. Fox, Milwaukee, discussed poliomyelitis at a meeting of the Green Lake-Waushara County Medical Society, June 17, and Dr. William C. Keettel Jr., Madison, showed a film on "Forceps Delivery."—Dr. Ralph C. Matson, Portland, Ore., addressed the Racine County Medical Society at a special meeting, May 29, on "Thoracoscopy in the Diagnosis and Management of Tumors of the Lung and Chest Wall."

PUERTO RICO

Institute on Tuberculosis.—The Insular Department of Health of Puerto Rico in cooperation with the Department of Public Health of the School of Tropical Medicine, University of Puerto Rico, presented an institute on tuberculosis on three week ends, May 2-18, in Rio Piedras. Dr. James A. Doull, Cleveland, who is visiting the island at the invitation of the health department and the school of tropical medicine, gave a series of lectures on the epidemiology of tuberculosis, assisted by Morton Kramer, assistant professor of biostatistics in the school of tropical medicine. Others who gave lectures and demonstrations included Drs. Eduardo Garrido Morales, health commissioner of the island, Guillermo Ruiz-Cestero, José Rodríguez Pastor, Oscar G. Costa Mandry, Jacobo Simonet, Enrique Koppisch, Libertad R. Gaetan and Vera A. Joseph, all of San Juan; Jerome S. Peterson, Mayaguez; Felix M. Reyes and Juan Arruza, Bayamon; David E. Garcia, Eduardo D. Maldonado and Jacob Smith, Rio Piedras.

GENERAL

Society News.—Dr. Cameron St. C. Guild, director of the Negro program of the National Tuberculosis Association, New York, has been appointed executive secretary of the American Trudeau Society on a part time basis. He will continue his other work with the assistance of a field worker.

Meeting of Physical Therapists.—The twentieth annual conference of the American Physiotherapy Association was held at Lagunita Court, Stanford University, Calif., June 13-18. Speakers included Dr. Herman Chor, Chicago, who discussed "Psychology of the Invalid and the Handicapped" and "Skeletal Muscle and Motor Activity in Health and Disease." The association sponsored a graduate program in physical therapy at the Stanford University Medical School, San Francisco, June 23 to July 18.

Cancer Journal Suspends Publication.—The *American Journal of Cancer* has discontinued publication because of lack of funds. The journal was started ten years ago by the late Francis P. Garvan, president of the Chemical Foundation, and this foundation has made up deficits heretofore, it was said. The last issue, dated December 1940, was released July 14, funds for its publication having been contributed by friends. It was said that the journal had lost many European subscribers and had also suffered a shrinkage of funds because of the expiration of patents. Dr. Francis Carter Wood, New York, was the editor.

Watch for Kidnap.—The special agent of the Federal Bureau of Investigation in Portland, Ore., has issued a notice to physicians and druggists identifying Clarence Vernon Stevens, who is believed to be under the care of physicians because of a heart ailment. Stevens was indicted in Kansas City, Mo., in 1933 as the kidnaper of Miss Mary McElroy of Kansas City. He is said to use digitalis and to breathe heavily. Any physician who obtains information about this man is asked to communicate directly with the special agent, J. D. Swenson, by telegraph or telephone collect. The telephone number is Broadway 0469, Portland.

Grants for Cancer Research.—The National Advisory Cancer Council at its quarterly meeting June 16 approved the following grants for research:

Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York, \$5,000 for study of metabolism in patients with cancer of the stomach.

University of Rochester School of Medicine and Dentistry, Rochester, N. Y., \$5,000 for a coordinated study of cancer of the stomach in human beings.

New York Hospital, New York, \$5,000 for research on early diagnosis. Dr. Robert S. Stone, University of California Medical School, San Francisco, \$9,750 for study of the curative value of fast neutrons on human cancer with the aid of the cyclotron.

Changes in Status of Licensure.—The Illinois State Department of Registration and Education announces the following action:

Dr. Edna Valeria Dale, Yakima, Wash., license revoked April 23 for conviction of Harrison Narcotic Act.

Dr. Harold Smith Parlee, Chicago, license revoked April 23 for conviction of performing an abortion.

The Maine Board of Registration in Medicine reported the following action taken at a recent meeting:

Dr. Benjamin P. Hurd, Waterville, license revoked for his conviction of performing an illegal abortion.

Dr. Atherton M. Ross, Farmington, license restored with the restriction that he should not deal in narcotics, make use of them personally and should not receive a permit under the Harrison Narcotic Act.

Prize for Study of Gonococcal Infections.—The American Neisserian Medical Society announces an annual prize of \$100, to be known as the P. S. Pelouze Prize and to be awarded to the person who in the opinion of an award committee has made the most important contribution to the control of gonococcal infections during the preceding year. Nominations for the award should be sent to the secretary not later than March 31 of each year, and the winner will be announced at the subsequent annual meeting of the society. Dr. Pelouze of Philadelphia is a member of the executive committee of the society. The secretary is Dr. Oscar F. Cox, 475 Commonwealth Avenue, Boston.

Insurance Physicians' Meeting.—The thirty-first annual meeting of the Medical Section of the American Life Convention was held at the Homestead, Hot Springs, Va., June 17-19. The speakers included Drs. William Boyd, Toronto, Ont., on "Genesis of Cancer"; Harry Goldblatt, Cleveland, "Hypertension"; James T. Bowman, London, Ont., "The Role of Clinical Judgment in Underwriting"; Ennion S. Williams, Richmond, Va., "Everyday Underwriting Practice with Respect to Colitis, Cardiospasm and Diverticulitis," and Cecil C. Birchard, Westmount, Que., "The Practical Value of Electrocardiograms in Selection." Dr. Wilton F. Blackford, Louisville, Ky., was elected chairman of the group, Dr. Thomas H. Dickson, St. Paul, vice chairman and Dr. Benjamin F. Byrd, Nashville, Tenn., secretary.

Society to Advance Psychoanalysis.—Announcement is made of the formation of the Association for the Advancement of Psychoanalysis by a group of psychiatrists in New York and several charter members from other cities. The training program will be carried on through the American Institute for Psychoanalysis, of which Dr. Karen Horney, New York, was elected dean. Lectures and seminars at New York Medical College by members of the association will be open to physicians and medical students. Other evening lectures and seminars at the New School for Social Research are open to lay persons interested in this field. Dr. William V. Silverberg, New York, is president of the new association; Dr. Clara M. Thompson, New York, vice president, and Dr. Harold Kelman, New York, secretary.

Appointments to Cancer Society Staff.—Dr. Samuel Binkley, assistant managing director of the American Society for the Control of Cancer in New York since June 1, 1940, has been appointed medical director. Dr. Binkley is a native of Oklahoma, a graduate of Harvard Medical School, Boston, and has been on the staff of Memorial Hospital for the Treatment of Cancer and Allied Diseases, New York, since 1936. Harold D. Fish, A.M., Evanston, Ill., has been appointed assistant managing director. Mr. Fish has been a teacher of biology and zoology and has been associated with the Carnegie Institution in the department of genetics, the Marine Biological Laboratory at Cold Spring Harbor, N. Y., and the Pittsburgh Skin and Cancer Foundation. Mr. A. Schaeffer Jr., formerly with the National Tuberculosis Association, has been appointed director of public relations.

Special Society Elections.—Dr. William C. Danforth, Evanston, Ill., was elected president of the American Gynecological Society at the annual meeting in Colorado Springs, May 26-28; Drs. Henricus J. Stander, New York, and Clarence B. Ingraham, Denver, were elected vice presidents, and Dr. Howard Taylor Jr., New York, was reelected secretary.—Dr. Joseph V. Klauder, Philadelphia, was elected president of the American Dermatological Association at the annual meeting in New Orleans in April; Dr. Ralph Hopkins, New Orleans, vice president, and Dr. Harry R. Foerster, Milwaukee, continued as secretary.—Dr. William Edward Chamberlain, Philadelphia, was elected president of the American College of Radiology at the annual meeting in Cleveland in June; Dr. James J. Clark, Atlanta, Ga., vice president, and Mr. Mac F. Cahal, Chicago, executive secretary. The 1942 meeting will be held in Atlantic City during the week of the annual session of the American Medical Association.

CANADA

Personal.—Dr. Duncan Graham, head of the department of medicine, University of Toronto Faculty of Medicine, has been appointed a member of the Canadian National Research Council to succeed the late Sir Frederick Banting.

Vancouver Summer School.—The Vancouver Medical Association presented its annual summer school clinics, June 17-20, at the Hotel Vancouver in Vancouver, B. C. The speakers were:

Dr. Perrin H. Long, professor of preventive medicine and director of the department, Johns Hopkins University School of Medicine, Baltimore.
Dr. Robert M. Jones, senior demonstrator of surgery, University of Toronto Faculty of Medicine.

Dr. Edwin E. Osgood, associate professor and head of the division of experimental medicine, University of Oregon Medical School, Portland.

Dr. C. Frederic Fluhmann, associate professor of obstetrics and gynecology, Stanford University School of Medicine, San Francisco.

Dr. Robert R. Struthers, professor of pediatrics, McGill University Faculty of Medicine, Montreal.

LATIN AMERICA

Society News.—The Second National Brazilian Congress of Tuberculosis was held in São Paulo, May 10-16, and Porto Alegre, May 16-20. The official themes were "Early and Late Results of Artificial Pneumothorax in Brazil," "Laws Concerning the Tuberculous" and "Tuberculosis in Rural and Small Urban Centers of the Country."

FOREIGN

Rush Atabrine to Burma Road.—The American Red Cross announced on July 13 that a shipment of two hundred thousand tablets of atabrine which was on its way to Rangoon, Burma, by boat has been taken from the ship at Honolulu to be sent by clipper because of urgent need for the drug in the treatment of malaria along the Burma Road. The Red Cross is also buying ten million quinine tablets at Batavia, Java, to be sent to southern Yunnan Province. Other medical supplies with a total value of \$1,000,000 are being purchased in this country and will be sent to unoccupied China through the Chinese Red Cross by the next available freighter.

Deaths in Other Countries

Sir William Henry Willcox, for many years lecturer on chemical pathology and forensic medicine at St. Mary's Hospital, London, died in London July 9.

Sir George Frederic Still, professor emeritus of diseases of children at King's College, London, and physician extraordinary to the king since 1937, died at Harnham Croft, Salisbury, recently, the *New York Times* reported July 1.

CORRECTION

Vitallium Skull Plates.—In the article by Dr. Fred W. Geib on "Vitallium Skull Plates" in *THE JOURNAL*, July 5, page 9, it was erroneously stated that vitallium is an alloy of cobalt, chromium and nickel. Vitallium is an alloy of cobalt, chromium and molybdenum and contains no nickel.

Government Services

CCC Enrollees Trained in First Aid

During the first ten months of the fiscal year ended June 30 a total of 108,776 enrollees completed the American Red Cross standard first aid course and received certificates. Last October the course was made compulsory for all enrollees. Ninety schools to train instructors were set up by the Red Cross and from July 1940 to the time of this report these schools had graduated 2,582 instructors, it was said.

Director of Nutrition Appointed

Mr. Milburn L. Wilson, director of extension service in the U. S. Department of Agriculture, Washington, D. C., has been appointed director of nutrition as an assistant to Paul V. McNutt, coordinator of health, welfare and related activities. He will be in charge of all government nutrition activities, will direct educational programs in the proper preparation of foods and will seek to enhance the nation's health by improving its diet, according to the *New York Times*.

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 10, 1941 (delayed).

New Forms of Treatment in Otolaryngology

At a combined meeting of the Sections of Otolaryngology and Laryngology of the Royal Society of Medicine a discussion took place on chemotherapy, serotherapy and hemotherapy in diseases of the ear, nose and throat. Col. L. E. H. Whitby said that the principles for the use of sulfonamide derivatives were the same as in any other region—the infecting organism must be sensitive, the concentration of the drug must reach and maintain an effective level and the position in which action was required must be favorable. In acute otitis media the incidence of grave complications was reduced by chemotherapy, though this was also affected by other factors, such as epidemic influenza. Each case called for individual consideration as to whether surgery or chemotherapy or both should be used. Pus always required drainage; bony involvement responded badly to chemotherapy. Sulfonamide derivatives must be given boldly and in full doses. Inadequate dosage masked symptoms and failed to eradicate infection. Chronic aural suppuration responded less well, probably because of bony involvement. Nevertheless, secondary infection with *Bacterium vulgare* or *Escherichia coli* were sometimes controlled. The treatment of nasal sinusitis was generally disappointing unless begun early before pus formation was definite or bone was involved. Streptococcal tonsillitis and adenitis responded well. In scarlet fever complications appeared to be reduced by a combination of chemotherapy and serotherapy.

Dr. H. F. Brewer said that the success of chemotherapy had greatly diminished the use of specific serums. But chemotherapy was directed against bacteria and did not affect toxins directly. Specific serum was still the treatment for diphtheria; the bacillus was at present unresponsive to chemotherapy. As an adjuvant to chemotherapy it might be beneficial in acute infections (especially with complications and metastatic spread) by the pneumococcus, staphylococcus and *Streptococcus pyogenes*. The indications for hemotherapy were infrequent. For simple anemia stored blood, up to 15 days old, compared favorably with fresh blood, but for anemia dependent on sepsis or for a blood disease such as hemophilia or thrombopenia, fresh blood was preferable.

Mr. T. B. Layton said that in thrombosed sinuses sulfonamide derivatives were likely to cause difficulty in diagnosis by masking symptoms without touching the disease. If there was no organism in the clot, the clot was a physiologic reaction and best left alone. If there was an organism, it would produce no symptoms until breaking down allowed organisms to pass into the blood stream. Chemotherapy would then mask the only symptom which enabled one to decide on operation.

Mr. F. W. Watkin-Thomas agreed as to the danger of chemotherapy masking symptoms, especially in septic lateral sinus phlebitis. Sulfonamide derivatives might be administered in the earliest stages of acute otitis media, but once paracentesis became necessary they should be stopped, because if there was going to be any further spread it would be to the bone, which the sulfonamide derivatives would not reach. The same applied even more strongly to intracranial complications.

Mr. Terence Cawthorne spoke of the good results from chemotherapy in septic meningitis. He had 9 recoveries in 15 cases. He had treated 3 cases of osteomyelitis of the frontal bone following frontal sinus infection by chemotherapy with simple drainage with recovery in all. Before chemotherapy extensive operation would have been done and, in his experience, would have been disappointing and mutilating.

Altered Coroners' Procedures in Cases of War Deaths

Under ordinary circumstances a coroner's inquest must be held in every case of death from violence or suspected violence, even though the cause of death is quite clear. When it was known that our civil population would be attacked from the air, a large number of deaths were expected and it was decided that inquests would not be necessary in cases of death due to war operations. Regulations have now been made giving new powers to coroners, which will make it unnecessary to apply to the high court for leave to presume the death of persons whose bodies cannot be found (as occurs when persons are blown to pieces by bomb explosions) or who cannot be identified after air raids. By a new defense regulation a coroner may hold an inquiry when a registrar of deaths reports that he has reasonable cause to believe that death has occurred in consequence of war operations and that the body of the person has been destroyed, cannot be found, is in a position from which it cannot be recovered or that it has been buried as that of a person unknown, or as that of some other person. A notice of the coroner's intention to hold an inquiry will be posted in a public place, and inquiries will be held without a jury and, unless the home secretary otherwise directs, in private. When a death occurs in consequence of war operations and the body is identified no inquest is held, as would be necessary in all cases of death from violence in time of peace.

Country Branches of the London Hospitals

The damage to Guy's Hospital from air attacks is not large, but the surrounding property, which it owns, has suffered severely. The result is a drop by about \$60,000 in the income from the rents. The evacuation of patients to safer areas has reduced to one hundred and eighty the beds for civilian sick, and two hundred beds are reserved for air raid casualties. Out-patient facilities are maintained. This month the hospital will open an annex in the country. To help in its equipment a gift of \$10,000 has been received from the American people. If further raids should seriously handicap the hospital, everything is ready for an immediate switch to the country hospital. The forming of country branches of the great London hospitals may prove to be more than a war measure. It may be an experiment which marks the beginning of new development, to be continued in peace time. Its effect on patients and any advantages to teaching and research are being closely watched.

Röntgen Service in Spite of Bombs

In consequence of the frequent bombing of hospitals the British Red Cross has built a fleet of twenty-five mobile roentgen plants capable of the most urgent hospital work. When a hospital is hit, this often means the loss of radiographic equipment just when most needed. The units supplied by the Red Cross are entirely self contained, being able to generate their own power, and they can thus enable a hospital to carry on in spite of the loss of its own plant or supply of electricity. Each unit costs from \$7,500 to \$9,000. The units will be placed at strategic points throughout the country, ready to serve the various hospitals.

The Danger of Flying Glass in Air Raids

The amount of broken glass from windows shattered by the blast of high explosive bombs in this country must run into many thousands of tons. The flying glass is exceedingly dangerous, as it cuts like a knife. A wide range of material is now available for protection against flying glass and for use as a substitute for glass. At an exhibition held in London, not fewer than eighty substitutes for glass were shown. They are weatherproof and can be fixed to metal frames by a special composition. A linen reinforced acetate is now very popular. In hospitals the windows have been bricked up, but this has obvious disadvantages.

BUENOS AIRES

(From Our Regular Correspondent)

May 15, 1941.

Health Conditions in Argentina

According to the report of the national health department for 1939, further progress has been made in malaria control. The endemic phase showed a tendency to decline. The rather extensive rainfalls during the year were not favorable to the kind of malaria found in Argentina. Tertian malaria increased clinically; quartan and tropical decreased, especially the latter. Malignant tertian, dreaded throughout the world, is more benign in Argentina than benignant tertian itself, Dr. C. A. Alvarado, in charge of malaria control, pointed out. *Anopheles pseudopunctipennis* was active in the adult stage throughout the year covered by the report. In consequence, the annual epidemic not only lasted longer but had an earlier start in the warmest portions of the epidemic zone. Although several species of *Anopheles* are encountered in the endemic zone of Argentina, *Anopheles pseudopunctipennis* plays the most active role. This species is not a dangerous disease vector and is not to be compared with *Anopheles gambiae*. The national health department of Argentina does not possess hospital facilities for malarial patients. The cooperation of schools needs to be further stimulated. The educational results achieved by the campaign surpassed expectations. Budget restrictions have affected the fight against malaria. Attempts to discover a plant that would crowd out *Algae spirogyrae*, needed by the larva of *Anopheles pseudopunctipennis*, have proved unavailing. Malarialogists differ in their view of the part irrigated rice fields play in the production of malaria. The conditions in different countries vary, and experiences gained in one cannot be applied elsewhere without investigation. Observations made in northern Argentina indicate that irrigated rice fields constitute a serious menace as breeding places. For this reason specific protective measures should be enforced, for example the requirement that dwelling places be constructed at a designated distance from the rice fields.

Five cases of bubonic plague occurred in 1939, 4 of them terminating fatally. The decrease in plague incidence in the last years is ascribed to increased health measures.

Trachoma is encountered especially in the northern provinces. There were only 5 cases of smallpox, 1 of which was fatal. In 1938 and 1937 there were respectively 53 and 80 cases. The source of infection must be sought in neighboring countries where smallpox is endemic. As the result of the extension of vaccination, Argentina is better protected against importation of the disease than formerly. Leprosy increased from an incidence of 3,500 to one of 3,900 cases. Four hundred and thirty-nine new cases were notified with 113 deaths. Two new leprosaries were erected. Another sanatorium is nearing completion. Only 538 persons, however, were institutionally cared for. Lepers living in Buenos Aires and vicinity are regularly inspected. Hookworm disease was actively combated, especially in the schools. About 47,000 persons were treated. The fact that latrines are not generally in use constitutes a source of infection.

Goiter is so largely disseminated in several northern provinces that in some schools a 100 per cent frequency is found among the children. The control is here carried out through physicians and teachers. Excellent results were obtained with iodine tablets. As many as 500,000 iodine tablets were distributed. No cases of intolerance were encountered. On the basis of the observations, tablets of 0.01 Gm. will be furnished hereafter instead of 0.005 Gm. previously used, even to small children. Adults are affected by these measures in relatively small numbers. It has therefore been proposed to distribute iodized salt in these districts without charge. Venereal infections are decreasing, if judged by the new cases reported. The education of the public continues by means of posters and a film

given the title "Blennorrhagia." The number of centers for maternity and infant welfare has grown in the interior of the country from twenty to twenty-nine. Their increased usefulness can be discerned from the fact that while 19,000 cases were given attention in 1938, some 50,000 were helped in 1939. Recexamination increased from 72,000 to 102,000. The distribution of articles of food, especially of milk cakes, has increased, though many difficulties need yet to be overcome. The number of pregnant women seeking advice grew from 5,000 to more than 10,000.

The control of narcotics, under the direction of Dr. R. A. Pita, has been extended. The organizational measures adopted and the results obtained have had a good effect on the control in the provinces, which are autonomous in medical legislation. Unification in the future of all laws pertaining to control of narcotics may result from it and thus facilitate general supervision. Buenos Aires is the only port for the legal importation of narcotic drugs. Several large provinces have already adopted the system of prescription receipts in use in the federal capital. The consumption of coca leaves is now under investigation to determine a plan of abolition of coca leaf mastication. The Bacteriologic Institute had an active year. The increased administrative work entailed by the manufacturing of drugs, which is part of the work of the institute, has greatly interfered with the scientific functions, which are its paramount functions, as its director, Dr. A. Sordelli, stressed. The stock of serums of all kinds was greatly increased. The smallpox vaccines manufactured by the institute for the past two years were much improved in quality. A new division for the rapid diagnosis of diphtheria was created. In six months it has carried out 3,500 analyses. The examination of 45,000 rats submitted by ships in ports of Argentina for plague control gave negative results and showed that overseas ports with which Argentina has agreements are free from plague. The Chemical Institute, a special division of the department of public health, also manufactures a larger number of drugs for current use.

NEWS FROM GERMANY

(Compiled from recent German periodicals)

Nursing Experience Required of Medical Students

According to a decree of April 3 issued by the ministry of the interior, medical students for whom the nursing training had been reduced will be required to serve the six months in active nursing or its accepted equivalent. The provisions of the law now apply in full also to male students preparing for medicine who were deemed unfit for active military duties and to female medical students. Those who already served three months and planned to begin their medical training with the summer semester of 1941 were permitted to postpone the remaining three months. Compliance with the full requirement is a prerequisite for admission to the medical examinations at the close of the summer half year of 1941. Until further notice, as much as three months' service in a nonclinical medical institute will be accepted as fulfilling half of the requirement (*Deutsche med. Wchnschr.* 67:522 [May 9] 1941).

Industrial and Traffic Accidents

In Germany, 16,400 persons lose their lives each year from accidents incurred either in traffic or in industry. About 270,000 traffic accidents occur annually, in which 7,400 persons are killed and 180,000 injured (*Deutsches Arzteblatt* 71:175 [April 12] 1941). Accidental injuries among children between the ages of 1 and 15 years, mostly incurred on the streets or at play, cause about 4,800 deaths. Children by the tens of thousands, however, suffer permanent damage. Of industrial accidents, including minor occurrences, 1,800,000 are reported annually. These result in 9,000 deaths; 85,000 persons are partially incapacitated for work, 2,000 permanently. A consider-

able proportion of those industrially injured recover the ability to work only to a limited extent. No statistics are kept for accidents in the home resulting in injury or death. They are computed, however, to be as high as those which occur in industry.

Röntgen Ray Examination of Polish Workers

According to a government decree, Polish civilians of either sex, admitted as laborers into Germany, will be roentgenologically examined for tuberculosis at designated ports of entry. The date of the examination is recorded on the worker's card and officially stamped. The results of the examination are not entered. The provisions of this decree have general application with the exception of certain sections on the eastern border. Regulations covering the roentgen ray examination of Polish workers already in Germany are in preparation (*Deutsche med. Wchnschr.* 67:522 [May 9] 1941).

Nazification of the University of Strasbourg

The formal opening of the former seat of French learning, after the pattern heralded by the Germans and recently reported in these columns (*THE JOURNAL*, May 31, p. 2522), is set for the beginning of the winter semester 1941-1942. The organization of the academic staff, determined by the head of the civil government with the approval of the national ministry of education, is now under way. Two appointments have already been announced: Prof. Friedrich Klinge, pathologic anatomist of the University of Münster, and Prof. Ernst Rodemwaldt, hygienist of the University of Heidelberg (*Klin. Wchnschr.* 20:408 [April 19] 1941).

Blood Test Restrictions

More than a year ago the German government established and promulgated the principles to be followed in organizing the blood donor service. The determination of the M and N characteristics of the blood is now prohibited until further notice. Moreover, governmentally approved testing serums may no longer be used except for the preparation of medicolegal opinions requested by the state (*Klin. Wchnschr.* 20:408 [April 19] 1941).

New Rumanian University

Owing to the cession of Klausenburg to Hungary, the Rumanian University will be transferred to Karlsburg (Alba Julia). The buildings are now in process of construction. Several of the faculties, including the faculty of medicine, are temporarily housed in Hermannstadt (*Klin. Wchnschr.* 20:408 [April 19] 1941).

Belgian Universities

The Belgian universities of Brussels, Liège, Ghent and Louvain are reported to have been reopened in November 1940 (*Klin. Wchnschr.* 20:408 [April 19] 1941).

Marriages

THOMAS E. KANE, Boone, Iowa, to Miss Dorothy Maxine Ekstrom of North Platte, Neb., April 2.

HARRY L. WALKER, Cedar Rapids, Iowa, to Miss Inez McCall of Tipton in Rochester, Minn., April 14.

CHARLES CLARKE SMELTZER to Miss Helen Pauline Brown, both of Knoxville, Tenn., May 15.

ROBERT Y. NETOLICKY, Cedar Rapids, Iowa, to Emilie Griffin of Marion at Nashua, May 24.

JOSEPH HANDLEY ROGERS to Miss Catherine Gail Shannon, both of Gadsden, Ala., May 4.

MILTON F. KIESAU, Postville, Iowa, to Miss Pauline Smith of Wapello, June 8.

LUTHER C. HICKERSON, Brooklyn, Iowa, to Miss Ruth Adams of Indianola, June 18.

Deaths

Meyer Bodansky • Galveston, Texas; University of Chicago, The School of Medicine, 1935; instructor of biological chemistry from 1919 to 1923, adjunct professor from 1923 to 1925 and associate professor from 1926 to 1930 and since 1930 professor of pathological chemistry at the University of Texas School of Medicine, which is now known as the University of Texas Medical Branch; visiting professor of physiological chemistry at the American University of Beirut, Syria, 1932-1933; member of the American Society of Clinical Pathologists; served in the ordnance department of the United States Army and later in the laboratory division of the medical corps, 1918-1919; director of the John Sealy Memorial Research Laboratory, John Sealy Hospital; author of "Introduction to Physiological Chemistry"; co-author of "Laboratory Manual of Physiological Chemistry" and "Biochemistry of Disease"; on the advisory editorial board of the *American Journal of Clinical Pathology*; aged 44; died, June 14, of bronchopneumonia following bilateral mastoiditis.

Thomas David Jones • Richmond, Va.; Medical College of Virginia, Richmond, 1906; assistant demonstrator of obstetrics from 1908 to 1911, assistant demonstrator of anatomy from 1909 to 1910, demonstrator of obstetrics from 1911 to 1913, adjunct professor of principles of surgery from 1911 to 1912, associate in pediatrics from 1924 to 1937 and since 1937 assistant professor of pediatrics at his alma mater; member of the American Academy of Pediatrics; past president of the Richmond Academy of Medicine; on the staffs of the Retreat for the Sick Hospital, Sheltering Arms Hospital, Dooley Hospital, St. Philip Hospital and the Memorial Hospital; aged 62; died, June 10.

Charles August Stammel • Lieut. Colonel, Medical Corps, United States Army, Fort Lewis, Wash.; Medical Department of the University of Cincinnati, 1910; entered the medical corps of the United States Army as a first lieutenant in 1918; served during the World War; rose through the various grades to that of lieutenant colonel in 1937; member of the Radiological Society of North America and the American College of Radiology; aged 55; died, May 25, of coronary occlusion.

Thomas Ash Claytor • Washington, D. C.; University of Pennsylvania Department of Medicine, Philadelphia, 1891; formerly clinical professor of medicine at the George Washington University School of Medicine; member of the American Clinical and Climatological Association; veteran of the Spanish-American and World wars; aged 71; died, June 4, in the Garfield Hospital of pneumonia.

Max Rosecrans Charlton • Tillamook, Ore.; State University of Iowa College of Medicine, Iowa City, 1906; at one time passed assistant surgeon in the United States Public Health Service reserve; served during the World War; fellow of the American College of Surgeons; aged 59; medical superintendent of the Charlton Hospital, where he died, May 31, of carcinoma of the liver.

Olin George Andrews Barker • Johnstown, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1898; member of the American Academy of Ophthalmology and Otolaryngology; past president of the Cambria County Medical Society; for many years on the staffs of the Mercy Hospital and the Conemaugh Valley Memorial Hospital; aged 69; died, May 28.

John Reed Brosheer, Middlesboro, Ky.; University of Louisville School of Medicine, 1937; member of the Kentucky State Medical Association; first lieutenant in the medical reserve corps of the United States Army; on the staff of the Middlesboro Hospital; aged 28; was killed, June 8, near Banning, Calif., in an airplane accident while on an army training flight.

Robert Irvine Bryson, Augusta, Ga.; University of Georgia Medical Department, Augusta, 1909; member of the Medical Association of Georgia; for many years clinical assistant and instructor in clinical dermatology and oncology at his alma mater; on the staff of the University Hospital; aged 55; died, June 4, of coronary thrombosis and chronic cholecystitis.

Otho James Powell, Ashland, Ohio; Western Reserve University Medical Department, Cleveland, 1898; member of the Ohio State Medical Association; past president of the Ashland County Medical Society; formerly member of the city board of education; at one time on the staff of the Samaritan Hospital; aged 70; died, May 24, of coronary occlusion.

Henry Michael McDonald • Surgeon Lieutenant Commander, United States Navy, retired, Los Angeles; University

of California Medical Department, San Francisco, 1912; entered the navy May 12, 1915 and retired Nov. 15, 1928 for incapacity resulting from an incident of service; aged 53; died, June 13, of coronary angiospasm due to chronic nephritis.

Walter R. Cleveland • Evansville, Ind.; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1906; member of the Radiological Society of North America, American College of Radiology and the American Radium Society; aged 56; on the staff of St. Mary's Hospital, where he died, June 10, of chronic cholelithiasis.

John Wesley Gorder, Greybull, Wyo.; Sioux City (Iowa) College of Medicine, 1903; member of the Wyoming State Medical Society; past president and secretary of the Northwestern Counties Medical Society; county health officer; on the staff of St. Luke's Hospital; aged 64; died, June 6, in a hospital at Billings of pneumonia.

Bernard Barrett Gilman, Boston; Harvard Medical School, Boston, 1929; member of the Massachusetts Medical Society; assistant director of the division of communicable diseases, Massachusetts Department of Public Health; aged 37; died, May 31, in the Baker Memorial Hospital of mesenteric embolism and rheumatic heart disease.

Albert T. Davis • Marion, Ind.; Medical College of Indiana, Indianapolis, 1904; past president of the Grant County Medical Society; served during the World War; on the staff of the Marion General Hospital; consultant in surgery, Veterans Administration Facility; aged 64; died, June 10, in Rochester, Minn., of glioma of the brain.

Douglas Culpepper McBride • Alexandria, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1918; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; on the staff of the Baptist Hospital; aged 48; died, June 12, in Memphis, Tenn., of cerebral hemorrhage.

Eldon Phillips, Cape Girardeau, Mo.; Missouri Medical College, St. Louis, 1883; member of the Missouri State Medical Association; at one time health officer of Stoddard County; formerly member of the board of education of Bloomfield; aged 90; died, May 21, in the Shorewood (Wis.) Hospital of chronic myocarditis.

Robert Everett Moss, La Grange, Texas; Jefferson Medical College of Philadelphia, 1883; member of the state Medical Association of Texas, American Laryngological, Rhinological and Otolological Society and the American Ophthalmological Society; fellow of the American College of Surgeons; aged 83; died in May.

Ora L. Pelton • Elgin, Ill.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1872; Bellevue Hospital Medical College, New York, 1874; fellow of the American College of Surgeons; surgeon, St. Joseph's and Sherman hospitals; aged 89; died, May 26, of uremia and nephritis.

William Stoddard Van Dalsem, San Jose, Calif.; Chicago Homeopathic Medical College, 1897; member of the California Medical Association; for many years member of the board of education; aged 68; died, April 18, in San Francisco of pneumonia following encephalitis and Parkinsonian syndrome.

Julien Harmon Wilson, Columbus, Ohio; Ohio State University College of Medicine, Columbus, 1922; member of the Ohio State Medical Association; on the staffs of St. Francis Hospital and the White Cross Hospital; aged 49; died, May 25, of injuries received in an automobile accident.

James Richard Clements, Pelham, Ga.; Atlanta College of Physicians and Surgeons, 1901; member of the Medical Association of Georgia; formerly mayor and member of the city council; for many years member of the board of education; aged 67; died, May 24, of myocarditis.

Sherman S. Frazier • Angola, Ind.; Fort Wayne College of Medicine, 1891; secretary of the Steuben County Medical Society; secretary of the city board of health; city health officer; aged 76; on the staff of the Cameron Hospital, where he died, June 10, of carcinomatosis.

Rocco De Rosa, Chicago; Chicago College of Medicine and Surgery, 1913; fellow of the American College of Surgeons; on the staffs of the Mother Cabrini Memorial Hospital, Chicago, and the Cook County Infirmary, Oak Forest; aged 52; died, June 8, of coronary thrombosis.

Laddie Walter Zeman, Hinsdale, Ill.; University of Illinois College of Medicine, Chicago, 1940; first lieutenant in the medical reserve corps of the United States Army; aged 27; was drowned, June 13, in a lagoon at San Juan, Puerto Rico, when the boat he was sailing capsized.

Samuel Seabury Graves, Chicago; Reliance Medical College, Chicago, 1909; formerly medical director of the Industrial Commission of Illinois and chairman of the medical committee of the International Association of Industrial Accident Boards; aged 71; was found dead, June 10.

Franklin McCue Hanger, Staunton, Va.; University of Virginia Department of Medicine, Charlottesville, 1883; member of the Medical Society of Virginia; past president of the Virginia Society of Ophthalmology and Otolaryngology; aged 79; died, June 17.

Herman Arthur Ehrmann, New York; College of Physicians and Surgeons, medical department of Columbia College, New York, 1886; aged 76; consultant in otolaryngology, Lenox Hill Hospital, where he died, June 2, of coronary thrombosis.

Walter Clarence Sherwood, Mitchell, Ind.; Vanderbilt University School of Medicine, Nashville, Tenn., 1901; member of the Indiana State Medical Association; formerly health officer; aged 64; died, May 29, of fracture of the right femur.

John R. May, Little Rock, Ark.; University of Arkansas School of Medicine, Little Rock, 1908; member of the Arkansas Medical Society; formerly superintendent of the Pulaski County Hospital; aged 57; died in June of a self-inflicted bullet wound.

Julius Trousdale Conditt, Hagerman, N. M.; University of Nashville (Tenn.) Medical Department, 1908; member of the New Mexico Medical Society; aged 59; died, May 25, in the Methodist Hospital, Albuquerque, of pulmonary tuberculosis.

John Chester Fleming @ Elkhart, Ind.; Northwestern University Medical School, Chicago, 1895; fellow of the American College of Surgeons; on the staff of the Elkhart General Hospital; aged 67; died, June 8, of cerebral hemorrhage.

Joseph G. Stulb, New Orleans; Medical Department of Tulane University of Louisiana, New Orleans, 1902; member of the Louisiana State Medical Society; aged 68; died, May 23, in the Touro Infirmary of carcinoma of the bladder.

Otho Perry Campbell, White Stone, Va.; Medical College of Virginia, Richmond, 1937; first lieutenant in the medical reserve corps of the United States Army; aged 28; died, June 2, in Richmond of pulmonary edema following pneumonia.

Fred Gerald Poutre @ Horton, Kan.; University of Kansas School of Medicine, Kansas City, 1910; served during the World War; aged 53; died, May 9, in the Veterans Administration Facility, Wadsworth, of coronary thrombosis.

Alfred B. Grosse @ San Mateo, Calif.; Cooper Medical College, San Francisco, 1894; member of the American Urological Association; aged 67; died, May 29, in the Mount Zion Hospital, San Francisco, of abdominal carcinomatosis.

Peter Cope White @ Tulsa, Okla.; Jefferson Medical College of Philadelphia, 1911; aged 51; on the staffs of St. John's Hospital and the Hillcrest Hospital, where he died, May 26, of peritonitis following a ruptured appendix.

Herbert Carey Walker @ Huntsville, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1927; past president of the Madison County Medical Society; served during the World War; aged 43; died, May 29.

Ora Richard Saul, Dana, Ill.; Chicago College of Medicine and Surgery, 1914; member of the Illinois State Medical Society; served during the World War; aged 50; died, May 29, of injuries received in an automobile accident.

Ludwig Cochran Heintz, Covington, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1906; formerly parish coroner; aged 55; died, May 24, in the Baptist Hospital, New Orleans, of bronchopneumonia.

Walter S. Gilmer, Henlawson, W. Va.; University College of Medicine, Richmond, 1910; member of the West Virginia State Medical Association; aged 56; died, June 8, in a hospital at Roanoke, Va., of pneumonia.

Lorin Farr Rich @ Rexburg, Idaho; Chattanooga (Tenn.) Medical College, 1901; Jefferson Medical College of Philadelphia, 1906; served during the World War; aged 60; died, May 14, of chronic interstitial nephritis.

John Prothero Laughlin, Pittsburgh; University of Pennsylvania Department of Medicine, Philadelphia, 1897; member of the Medical Society of the State of Pennsylvania; aged 69; died, May 23, of cerebral hemorrhage.

Clyde Livingstone Smith @ Maywood, Calif.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; served during the World War; aged 62; died, May 17, of septicemia.

Charles Edward Hablutzal, San Jose, Calif.; Cooper Medical College, San Francisco, 1895; member of the California Medical Association; served during the World War; aged 76; died, May 31, of Parkinson's disease.

Albert Louis Wilsford, Moro, Ark.; University of Tennessee Medical Department, Nashville, 1888; for many years member of the school board; formerly member of the state legislature; aged 72; died, May 17.

William Brigham Parkinson @ Fairfield, Idaho; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; aged 63; died in May in Twin Falls of coronary embolism.

Ira Chestnut Young, El Paso, Texas; University of Louisville (Ky.) Medical Department, 1892; Illinois Medical College, Chicago, 1904; also a lawyer and a minister; aged 69; died, May 27, of cerebral hemorrhage.

William A. Beason, Ashville, Ala.; College of Physicians and Surgeons, Baltimore, 1893; member of the Medical Association of the State of Alabama; bank president; aged 73; died, May 23, of cerebral hemorrhage.

Whittlesey Du Bois Lester, Schenectady, N. Y.; Albany Medical College, 1899; member of the Medical Society of the State of New York; aged 66; died, June 9, in the Ellis Hospital of cerebral hemorrhage.

Herbert J. Patterson, Portland, Maine; College of Physicians and Surgeons, Baltimore, 1885; member of the Maine Medical Association; aged 79; died, May 13, of carcinoma of the pancreas and biliary calculi.

Van Ingersoll Allen, Creston, Ohio; Eclectic Medical Institute, Cincinnati, 1907; member of the Ohio State Medical Association; aged 57; died, May 30, in the Municipal Hospital, Tampa, Fla., of pneumonia.

Joseph Frame, Rockland, Mass.; Harvard Medical School, Boston, 1894; member of the Massachusetts Medical Society; for many years member of the board of health; aged 74; died, May 23, of arteriosclerosis.

Hermas Deslauriers, Montreal, Que., Canada; M.B., School of Medicine and Surgery of Montreal, Faculty of Medicine of the University of Laval at Montreal, 1904, and M.D., 1905; aged 61; died, May 28.

Harry Lawton Dougherty, Boston; University of Louisville (Ky.) School of Medicine, 1925; member of the Massachusetts Medical Society; on the staff of the Faulkner Hospital; aged 42; died, June 1.

Robert William Maclellan, Halifax, N. S., Canada; Dalhousie University Faculty of Medicine, Halifax, 1938; captain in the Reserve Canadian Army Medical Corps; aged 26; died, May 6, of pneumonia.

Charles Wilson Goodwin, Staten Island, N. Y.; Harvard Medical School, Boston, 1906; aged 72; formerly superintendent of the Staten Island Hospital, where he died, June 3, of cardiorenal disease.

Richard Henry Wessels, Mancelona, Mich.; St. Louis College of Physicians and Surgeons, 1900; member of the Michigan State Medical Society; aged 72; died, May 24, of cerebral hemorrhage.

John Turner Bynum Jr. @ Big Spring, Texas; University of Texas School of Medicine, Galveston, 1927; on the staff of the Big Spring State Hospital; aged 38; died, May 23, of gastric hemorrhage.

John H. Bannister, Charleston, W. Va.; College of Physicians and Surgeons, Baltimore, 1912; aged 54; died, June 2, of bronchopneumonia and trauma to the chest following an automobile accident.

Gean Dutton Cleaver, Los Angeles; John A. Creighton Medical College, Omaha, 1909; served during the World War; aged 56; died, May 26, in the Veterans Administration Facility, West Los Angeles.

William Alexander Moore, Tacoma, Wash.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1914; member of the Washington State Medical Association; aged 63; died in May.

Bernard Kohn @ Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1899; aged 65; served in various capacities on the staff of the Jewish Hospital, where he died, May 21.

Thomas E. Walton @ Danville, Ill.; Kentucky School of Medicine, Louisville, 1889; aged 80; on the emeritus staff of St. Elizabeth Hospital and the Lakeview Hospital, where he died, May 29.

John H. Seaman, New Haven, Mich.; Michigan College of Medicine and Surgery, Detroit, 1891; member of the Michigan State Medical Society; aged 75; died, May 27, of cerebral hemorrhage.

John D. Westrick, Defiance, Ohio; Toledo Medical College, 1888; member of the Ohio State Medical Association; formerly city health officer; aged 79; died, May 24, of chronic myocarditis.

Mary Babcock Atwater, Berkeley, Calif.; Woman's Medical College, Chicago, 1887; aged 82; died, June 1, in the Alta Bates Hospital of carcinoma of the gallbladder with metastases to the liver.

Charles Joseph Schmeltz, Guerneville, Calif.; University of California Medical Department, San Francisco, 1895; member of the California Medical Association; aged 76; died, May 31.

William Saunderson Yeager @ Georgiana, Fla.; Medical College of Ohio, Cincinnati, 1908; member of the Ohio State Medical Association; aged 53; died, May 25, of valvular heart disease.

Frederic D. Falby, Huntington, Vt.; University of Vermont College of Medicine, Burlington, 1888; formerly member of the state legislature; at one time school director; aged 74; died, June 1.

Harry Scott Monroe, New Florence, Pa.; Eclectic Medical College, Cincinnati, 1911; on the staff of the Veterans Administration Facility; aged 54; died, May 28, of burns received in a fire.

Martin Gould Marden, Newark, N. J.; University of Louisville (Ky.) Medical Department, 1902; veteran of the Spanish-American and World wars; aged 65; died, June 19.

William Thomas Bruner, Louisville, Ky.; Hospital College of Medicine, Louisville, 1896; aged 70; died, June 3, in the Kentucky Baptist Hospital following an appendectomy.

Albert Newell Benedict, Yonkers, N. Y.; Cornell University Medical College, New York, 1905; served during the World War; aged 59; died, June 3, of coronary occlusion.

Peter J. Haigis, Foxboro, Mass.; Boston University School of Medicine, 1904; member of the Massachusetts Medical Society; aged 67; died, June 2, of carcinomatosis.

William H. Heisen, El Paso, Texas; Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, Germany, 1889; aged 78; died, May 13, of coronary occlusion.

Clara M. Luther, Minneapolis; Minneapolis College of Physicians and Surgeons, 1901; aged 82; died, May 8, in the Franklin Hospital of cerebral thrombosis and hemiplegia.

Charles E. Coffin, Winter Park, Fla.; Omaha Medical College, 1889; at one time mayor of Winter Park; aged 76; died, June 9, in the Orange General Hospital, Orlando.

Charles R. Applegate, New Castle, Ind.; Kentucky School of Medicine, Louisville, 1901; served during the World War; aged 69; died, June 8, in the Henry County Hospital.

Roley T. Akers, Alum Ridge, Va. (licensed in Virginia by years of practice); also a minister; member of the county school board; aged 83; died, June 16, of myocarditis.

Amelia Viola Zimmerman, Baltimore; Southern Homeopathic Medical College, Baltimore, 1895; aged 69; died, May 27, of arteriosclerosis, hypertension and myocarditis.

Elwood Wand, Woodbury, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1886; aged 84; died, May 13, of arteriosclerosis, hypertension and myocarditis.

William Burton Collier, Littleton, Colo.; Medico-Chirurgical College of Philadelphia, 1900; formerly owner of a hospital bearing his name; aged 70; died, May 12.

Henry A. Whillans, Zeballos, B. C., Canada; McGill University Faculty of Medicine, Montreal, Que., 1899; served during the World War; aged 69; died, April 20.

Pleasant Henry Askew Jr. @ Nashville, Ga.; University of Georgia School of Medicine, Augusta, 1934; aged 31; was killed, May 29, in an automobile accident.

I. E. Stennis, McComb, Miss.; Louisville (Ky.) Medical College, 1893; member of the Mississippi State Medical Association; aged 75; died, May 9, of myocarditis.

Lee Henry Curran, Tacoma, Wash.; Starling-Ohio Medical College, Columbus, 1913; formerly connected with the U. S. Indian Service; aged 52; died, April 27.

Walter Frederick Noyes @ Colebrook, N. H.; University of Vermont College of Medicine, Burlington, 1908; aged 55; died in May of a self-inflicted bullet wound.

James Hiram Hasty, Atlanta, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1908; aged 60; died, June 6, of arteriosclerosis and heart disease.

Robert Barnabas Keane, Bridgeport, Conn.; University and Bellevue Hospital Medical College, New York, 1903; aged 65; died, May 23, in St. Vincent's Hospital.

Neil Clayton Matzek, Belmont, Mass.; Tufts College Medical School, Boston, 1921; member of the Massachusetts Medical Society; aged 44; died, May 14.

William Franklin Watkins, Maywood, Ky.; Hospital College of Medicine, Louisville, 1889; aged 87; died, May 31, of epithelioma of the face and neck.

James Finley Hanna, Adena, Ohio; Medical College of Ohio, Cincinnati, 1895; aged 74; died, May 29, in Martins Ferry of carcinoma of the bladder.

John Leonard George, Tillamook, Ore.; Willamette University Medical Department, Salem, 1907; aged 68; died, May 16, of coronary occlusion.

Virginia Dinsmore, Griggsville, Ill.; Woman's Medical College, Chicago, 1889; aged 87; died, May 26, in Pittsfield, of acute dilatation of the heart.

George C. Wallace, Rock Rapids, Iowa; College of Physicians and Surgeons, Keokuk, 1877; aged 90; died, May 22, of cirrhosis of the liver.

Joseph E. Wharton, Peoria, Ill.; Drake University Medical Department, Des Moines, Iowa, 1898; aged 67; died, May 10, of coronary thrombosis.

Ledford A. Williams, Abbeville, Ga.; Atlanta Medical College, 1894; member of the Medical Association of Georgia; aged 75; died, May 13.

William Connolly, Cresco, Iowa; Rush Medical College, Chicago, 1883; aged 80; died, May 15, of edema of the lungs and cardiorenal disease.

William R. Kellam, Perryville, Texas (licensed in Texas under the Act of 1907); aged 84; died, May 12, of carcinoma of the urinary bladder.

Arthur Bascom Hardin, McCook, Neb.; Keokuk (Iowa) Medical College, 1896; Barnes Medical College, St. Louis, 1897; aged 76; died, May 14.

William Hazen Embree, Stellarton, N. S., Canada; Dalhousie University Faculty of Medicine, Halifax, 1938; aged 31; died in May.

Charles Franklin Benson, Winnipeg, Man., Canada; University of Manitoba Faculty of Medicine, Winnipeg, 1936; aged 32; died, June 3.

Frank S. Gray, Allendale, Ill.; Medical College of Ohio, Cincinnati, 1883; aged 86; died, May 26, of myocarditis and arteriosclerosis.

Joel C. Freemon, Argenta, Ill.; Hahnemann Medical College and Hospital, Chicago, 1903; aged 60; died, May 27, of heart disease.

Abe Maurice Hilkowich, New York; Cornell University Medical College, New York, 1904; aged 64; died, June 7, of heart disease.

Glenn Edward Prime, Neotsu, Ore.; University of Oregon Medical School, Portland, 1915; aged 53; died, April 20, of heart disease.

James Moffat Forster, Oakville, Ont., Canada; Victoria University Medical Department, Coburg, 1886; aged 76; died, May 30.

Albert Thomas Macnamara, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1897; aged 76; died, May 25.

John Ross Russell, Arthur, Ont., Canada; University of Western Ontario Medical School, London, 1928; aged 37; died, May 20.

John Angier MacGregor, West Frankfort, Ill.; Barnes Medical College, St. Louis, 1898; aged 67; died, May 14, in Chicago.

Frederick Judson Bell, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1919; aged 46; died, June 3.

George Hardy Clark, Long Beach, Calif.; Hahnemann Medical College and Hospital, Chicago, 1882; aged 81; died in May.

Emma J. Warren, Chicago; Northwestern University Woman's Medical School, Chicago, 1893; aged 77; died, May 21.

Richmond E. Gibson, Flournoy, Calif.; University of Buffalo School of Medicine, 1890; aged 86; died, May 28.

John Olson, St. Louis; Barnes Medical College, St. Louis, 1906; aged 71; died, May 22, of coronary occlusion.

Bureau of Investigation

CEASE AND DESIST ORDERS

Abstracts of Certain Federal Trade Commission Releases

The work of the Federal Trade Commission, in helping to protect the public against misrepresentation or fraud in the medical as well as other fields, has been greatly extended by the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act. The Food, Drug and Cosmetic Act of 1938 added to the Food and Drug Administration's control of the advertising claims and statements made on the labels of medicines or on the carton or in the accompanying leaflet, whereas what might be termed collateral advertising, that which appears in newspapers and magazines and over the air, comes more actively under the purview of the Federal Trade Commission, by virtue of the Wheeler-Lea Amendment.

THE JOURNAL has at various times commented on the activities of the Federal Trade Commission in this connection, even before the Wheeler-Lea Amendment gave it its added rights. In some cases the Commission may accept from the person or concern involved a stipulation that the objectionable practices or claims cited will be discontinued. In other cases the Commission issues what is known as a Cease and Desist Order, in which the individual, manufacturer or distributor cited is ordered to cease and desist from practices which have been declared objectionable.

Abstracts of some of the orders issued during 1940 follow:

Le Flor Weight Reduction Tablets.—These were sold also under the name of "Le Flor Method" by one Leland F. Benham, trading as the Le Flor Company, Chicago, and still earlier as Dixie Products Company. They were found to have no therapeutic value beyond that of a cathartic or a laxative, as they consisted of dextrose, phenolphthalein, powdered extract of bladderwrack and talc. On May 4, 1940, the Federal Trade Commission ordered the Le Flor concern to cease advertising that their product was a cure or remedy for obesity and did not contain any dehydrating drugs, whereas the phenolphthalein is a dehydrating drug.

Marrow Cosmetic Products.—The J. W. Marrow Manufacturing Company of Chicago was ordered by the Federal Trade Commission on April 7, 1940, to cease and desist from representing that its preparations will nourish the skin or prevent, remove or correct lines or wrinkles; that "Marrow Acne Cream" will correct or remove blemishes, pimples or enlarged pores, or that it has antiseptic properties; that "Mar-O-Oil" will revitalize dead hair or correct the cause of excessive oiliness of the hair, and that "Trimal" contains oil or has any effect on live cuticle or on the growth of finger nails. The order also prohibited false representation of the extent to which those who professionally treat the hair or skin have adopted and used the company's preparations, and the extent to which scientists or other experts who supervise and direct makeup in motion picture studios recommend or specify the use of the concern's cosmetics.

Mary T. Goldman's Gray Hair Color Restorer.—This dye of the silver-salt type has been on the market for many years. On March 14, 1940, the Federal Trade Commission ordered the Mary T. Goldman Company, St. Paul, and the Monroe Chemical Company, Quincy, Ill., to cease and desist from representing, among other things, that their preparation is not a dye and that it will cause gray, faded or streaked hair to change color without dyeing it; that it will restore the natural, original or youthful color to gray hair or remove all trace of gray hair in any other manner than as a dye. The order also prohibits the representation that anything less than repeated applications of the Goldman preparation will change the color of the user's hair or cause it to maintain the color imparted by the product, and forbids use of the word "restorer" as part of the brand name for the product. Representation that Mary T. Goldman is a living individual personally recommending the preparation, or personally corresponding with the users or prospective users thereof, is also prohibited under the order.

Mayco Nostrums.—These were promoted by May's Cut Rate Drug Company, Clarkshurg, W. Va., May's Cut Rate Drug Company, Charleston, W. Va., and Pittsburgh Cut Rate Drug Company, McKeesport, Pa. The products in question included "Genuine Mayco English Crown Female Capsules for Delayed Periods" in ordinary, double and triple strengths. This was also designated simply "Mayco" by the Clarkshurg and Charleston dealers. Examination revealed that it contained apiol green, ergotin, oil of savin and aloin in quantities sufficient to cause serious and irreparable injury to health if used under the conditions prescribed in the advertisements or under customary or usual conditions. On July 12, 1940, the Federal Trade Commission reported that it had ordered the defendant companies to cease representing that their product is a safe, competent and effective preparation for use in the treatment of delayed menstruation. The order further forbids advertisements which fail to reveal that the use of the preparation may result in serious and irreparable injury to health.

Mentho-Mulsion.—This product is put out by Mentho-Mulsion, Inc., of Atlanta, Ga., which was reported to be run by a Max L. Clein and a Sadie B. Clein. On Jan. 22, 1940, the Federal Trade Commission ordered it to cease and desist from making certain misrepresentations, such as that its "Mentho-Mulsion" is a cure or remedy for coughs or will stop cough spasms or prove efficacious in the treatment of coughs due to physical disorders of a systemic character, or of any coughs, aside from being a temporary relief for those due to common colds. The concern also was directed to cease representing that another of its products, "Malco Cold Tablets," will dry common colds out of the system, act as a cure or remedy for colds, or have any effect on them except as a relief from some of the symptoms commonly accompanying them.

Motex and Cote Nostrums.—A concern operating variously as the Western Refining Company, Inc., The Motex Company and Cote Products Company at Lowell, Mass., put out "Motex," "Motex Pills" and "Cote Pills." On April 6, 1940, the Federal Trade Commission ordered this outfit to cease and desist from representing that these products are safe, competent or scientific remedies for delayed menstruation, that they contain no harmful or dangerous drugs or that they will have no ill effects on the body. The order declared that their use may result in serious or irreparable injury to health. Still earlier, on July 21, 1939, the Post Office Department had debarred this concern from the use of the mails on the ground that its business constituted a fraud on the public. This case, designated as Fraud Order no. 13169, was reported in THE JOURNAL, April 20, 1940, p. 1574.

Premek 33.—This item is put out by The Patch Premek Corporation of Los Angeles, which had for its president one H. K. Patch and also traded under the name H. K. Patch Company. The Federal Trade Commission charged that this concern's advertising set forth its product "Premek 33" (sold to the medical profession as "C. S. 53") as an amazing new discovery effective for ending all kinds of irritations and capable of curing eczema, athlete's foot, chafing, shingles, ringworm and similar conditions. The Commission ordered the Patch concern to discontinue these misrepresentations on the ground that the only ingredient in the product which has any medicinal importance is colloidal sulfur, which is neither a new nor an amazing discovery and that the preparation is not a quick or effective treatment for the conditions named. Further, the order directed the company to cease representing that Premek 33 will kill bacteria, prevent reinfection or stop perspiration.

Scall's Indian River Tonic.—On April 25, 1940, the Federal Trade Commission ordered the Indian River Medicine Company, La Follette, Tenn., to discontinue making certain misrepresentations for its product in its radio, newspaper and magazine advertisements. Among these were that the stuff will prevent and cure colds, build up resistance to other minor ailments, remedy asthma, rheumatism, sleeplessness, liver, kidney and stomach troubles and some other things.

Shampo-Kolor.—This was advertised by Valligny Products, Inc., New York. The Federal Trade Commission found the advertising to be exaggerated and misleading and on April 3, 1940, it ordered the concern to cease and desist from representing (1) that "Shampo-Kolor" will color the roots of the hair or have any effect thereon or on new hair growth, or restore the natural or original color to the hair, or affect the color of the hair in any way other than as a dye; (2) that anything less than repeated applications will cause the hair to retain the color imparted by the preparation; (3) that Shampo-Kolor is compounded or manufactured in France or in any country other than the United States, and (4) that it is "unique" or "revolutionary" in methods or results.

S. M. Laboratories Company.—This Seattle firm put out "Neofem Liquid," "Neofem Capsules" and "Cerene." The Federal Trade Commission, on May 19, 1940, reported that these products contained ergot, oil of savin and aloin in sufficient quantities to cause serious and irreparable injury if used under the conditions prescribed in the advertisements or under customary or usual conditions. It therefore ordered the concern to cease representing them as safe, competent or effective treatments for delayed menstruation.

Tommy Loughran Exercises.—Tommy Loughran of Philadelphia is engaged in the sale and distribution of correspondence courses that outline methods of physical culture, exercise and instruction as to diet for improving the health and physical condition of purchasers. On Oct. 25, 1940, the Federal Trade Commission ordered Loughran to cease and desist from representing directly or by implication that the following of these instructions will produce good health for every one or keep every one in healthy condition; will insure to every one "big" muscles or a "huge," "robust" and "powerful" body or enable one to become a "paragon" of strength; as such representations were held to be exaggerated and misleading.

Vita-Perles.—The Federal Trade Commission on March 21, 1940, ordered John H. Morgan, American Distributors, Inc., and Champion Products Company, Linton, Ind., and the United Advertising Company, Inc., Chicago, to discontinue representing that "Vita-Perles" may be obtained and tested without risking the loss of any money; that lack of ache, headache, leg pains and various other ailments are caused by a vitamin deficiency or that such conditions will be relieved or corrected by the use of the respondents' preparation; that those who are thin, pale and sickly will by the use of the preparation acquire additional weight, an improved complexion, an increased resistance to colds and infections, an improved appetite or will become less nervous; that the impairment to a vitamin deficiency, or that these powers will be restored or improved by the use of the preparation, or that its use will increase the general strength and energy, or that the preparation will affect women's ability to conceive or bear children successfully, except in rare cases involving habitual involuntary abortion where inability to bear children successfully after conception may be due to a deficiency of vitamin E of a degree susceptible of replacement by the vitamin E content of the preparation.

Medical Examinations and Licensure

COMING EXAMINATIONS

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, July 19, page 216.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, Sept. 10-12. Part III. Baltimore and New York City, October; Boston, November. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written. Part I.* Various centers, Nov. 1. Final date for filing application is Aug. 4. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York City.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written.* Nov. 3. Final date for filing application is Sept. 23. *Oral.* Dec. 12-13. Final date for filing application is Nov. 8. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Oct. 20. Final date for filing application is Sept. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral.* St. Louis, Oct. 31-Nov. 1. Final date for filing application is Aug. 1. Sec., Dr. R. Glen Spurling, 404 Brown Bldg., Louisville, Ky.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written. Part I. Group B.* Jan. 3. *Oral. Part II. Groups A and B.* Atlantic City, May or June. Final date for filing application is 90 days in advance of the examination. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral.* Portland, July 15; Chicago, Oct. 18. *Written.* March 7, 1942. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Washington, January. Final date for filing application is Nov. 1. Sec., Dr. Guy A. Caldwell, 1640 State St., New Orleans, La.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Boston, Oct. 7-8, immediately following the annual meeting of the American Academy of Pediatrics. *Written.* Locally, Aug. 22. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Oral.* New York, Dec. 19-20. Final date for filing application is Oct. 5. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: *Oral. All groups.* Cincinnati, Sept. 19-21. Final date for filing application is Aug. 1. Sec., Dr. Byrl R. Kirklm, 102-110 Second Ave., S. W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written. Part I.* Various centers, Oct. 6. Sec., Dr. J. Stewart Rodman, 225 S. Fifteenth St., Philadelphia.

AMERICAN BOARD OF UROLOGY: *Written.* Various centers, December. *Oral.* Chicago, February. Final date for filing application is Nov. 1. Sec., Dr. Gilbert J. Thomas, 1009 Nicolet Ave., Minneapolis.

West Virginia March Report

The Public Health Council of West Virginia reports the oral and written examination for medical licensure held at Charleston, March 3-5, 1941. The examination covered 11 subjects and included 110 questions. An average of 80 per cent was required to pass. Six candidates were examined, all of whom passed. Thirteen physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Howard University College of Medicine.....	(1939)		91.5
Northwestern University Medical School.....	(1941)		88.5
Jefferson Medical College of Philadelphia.....	(1939)		88.5, 90.2
University of Tennessee College of Medicine.....	(1927)		86.1
Laval University Faculty of Medicine.....	(1940)		88.4
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Howard University College of Medicine.....	(1936)		Missouri
Emory University School of Medicine.....	(1928)		Georgia
University of Louisville School of Medicine.....	(1935)		Ohio,
(1937) Kentucky			
Ohio State University College of Medicine....	(1931), (1937)		Ohio
Hahnemann Medical College and Hospital of Philadelphia.....	(1933)		Delaware
Temple University School of Medicine.....	(1924), (1934)		Penna.
University of Pittsburgh School of Medicine.....	(1938)		Penna.
Medical College of Virginia.....	(1938)		Tennessee
University of Virginia Department of Medicine.....	(1937)		Virginia
School	LICENSED BY ENDOORSEMENT	Year Grad.	
Georgetown University School of Medicine.....	(1937, 2)		

Oregon Reciprocity Report

The Oregon State Board of Medical Examiners reports 3 physicians licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners, on April 3. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Yale University School of Medicine.....	(1931)		California
Northwestern University Medical School.....	(1936)		Illinois
Hahnemann Medical College and Hospital of Philadelphia.....	(1931)		Penna.
School	LICENSED BY ENDOORSEMENT	Year Grad.	
Rush Medical College.....	(1932)		
Marquette University School of Medicine.....	(1935)		

Rhode Island March Report

The Rhode Island Board of Examiners in Medicine reports the written examination for medical licensure held at Providence, March 4-5, 1941. The examination covered 8 subjects and included 50 questions. An average of 80 per cent was required to pass. Three candidates were examined, all of whom passed. One physician was licensed to practice medicine on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Syracuse University College of Medicine.....	(1938)		86
McGill University Faculty of Medicine.....	(1939)		90
University of Montreal Faculty of Medicine.....	(1940)		84.5
School	LICENSED BY ENDOORSEMENT	Year Grad.	
Harvard Medical School.....	(1937)		

Oregon January Report

The Oregon State Board of Medical Examiners reports the written examination for medical licensure held at Portland, Jan. 14-16, 1941. The examination covered 12 subjects and included 90 questions. An average of 75 per cent was required to pass. Two candidates were examined, both of whom passed. Two physicians were licensed to practice medicine by reciprocity and one physician was so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Oregon Medical School.....	(1939)		87.7, 92.3
School	LICENSE BY RECIPROCITY	Year Grad.	Reciprocity with
University of California Medical School.....	(1940)		California
University of Minnesota Medical School.....	(1928)		Minnesota
School	LICENSED BY ENDOORSEMENT	Year Grad.	
The School of Medicine of the Division of the Biological Sciences..	(1936)		

Arizona April Report

The Arizona State Board of Medical Examiners reports the written examination for medical licensure held at Phoenix, April 1-2, 1941. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. One candidate was examined and passed. Four physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Loyola University School of Medicine.....	(1940)		83.1
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Stanford University School of Medicine.....	(1937)		California
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1917)		Penna.
Ohio State University College of Medicine.....	(1923)		Ohio
University of Pittsburgh School of Medicine.....	(1930)		Penna.
School	LICENSED BY ENDOORSEMENT	Year Grad.	
Yale University School of Medicine.....	(1936)		
Jefferson Medical College of Philadelphia.....	(1925)		

Idaho April Report

The Idaho State Medical Examining Board reports the written examination for medical licensure held at Boise, April 1, 1941. The examination covered 23 subjects and included 140 questions. An average of 75 per cent was required to pass. Fifteen candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists.....	(1932)	89	
Northwestern University Medical School.....	(1937)	91	
Rush Medical College.....	(1939)	87	
University of Chicago, The School of Medicine.....	(1939)	87	
University of Louisville School of Medicine.....	(1930) 87, (1939)	87	
Louisiana State University School of Medicine.....	(1940)	89	
University of Michigan Medical School.....	(1935) 94, (1936)	92	
University of Minnesota Medical School.....	(1939)	86	
Creighton University School of Medicine.....	(1929)	93	
Cotner University Medical Department.....	(1912)	81	
Cornell University Medical College.....	(1937)	89	
University of Nebraska College of Medicine.....	(1924)	88	
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn.....	(1933)*		

* License has not been issued.

Vermont February Report

The Vermont State Board of Medical Registration reports the written examination for medical licensure held at Burlington, Feb. 11-13, 1941. The examination covered 12 subjects and included 90 questions. An average of 75 per cent was required to pass. Five candidates were examined, all of whom passed. Four physicians were licensed to practice medicine by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
George Washington University School of Medicine.....	(1939)	86.4	
Georgetown University School of Medicine.....	(1937)	86.6	
Boston University School of Medicine.....	(1924)	83.7	
Tufts College Medical School.....	(1925)	83.2	
University of Vermont College of Medicine.....	(1940)	87.5*	

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad. of
New York Medical College and Flower Hospital.....	(1937) N. B. M. Ex.	
University of Vermont College of Medicine.....	(1921) New York,	
(1939) N. B. M. Ex.		
University of Toronto Faculty of Medicine.....	(1924) R. Island	

* This applicant has completed four years' medical work and will receive the M.D. degree on completion of internship. License has not been issued.

Miscellany

A DEFENSE OF ANIMAL EXPERIMENTATION

Recent agitation regarding animal experimentation in the Hearst newspapers apparently stimulated the following editorial in the *Chicago Tribune*, July 15:

SPEAKING OF HORRORS

The most astonishing thing about the self-styled antivivisectionists is their pertinacity in a cause that is as thoroughly discredited as it is bad. They have not imposed their particular brand of insanity on a civilized community in years, yet they keep coming up for more.

Their most recent incursion has been at Peoria. The members of the city council, most of whom, by the law of averages, must have some member of their families who is alive today only because of medical progress through animal experimentation, have been subjected to the usual fictions regarding the horrors to be found in medical laboratories.

A recent dispatch noted that Dr. Anton J. Carlson had landed, and no doubt he has the situation in hand by now. The Peoria affair may safely be left to the doughty doctor and the good sense of the town's own people. It is a pity, however, that men like Dr. Carlson must, from time to time, drop their work against death and human misery to refute once again the time-frayed arguments of ignorance and perverted sentimentality.

Vivisection is an intentionally misleading word. The majority of experimental animals are not subjected to surgery. Those

that are are almost invariably placed under a local or general anesthetic and are painlessly destroyed thereafter—the same fate experimental dogs would meet if they were left in the pounds from which medical laboratories obtain them.

Every medical or other scientific laboratory has the strictest rules, rigidly enforced, to prevent abuse of or cruelty to experimental animals. As scientists have frequently pointed out, the ordinary operations of husbandry, performed without anesthesia, subject animals to more pain in any single day than they have suffered in a century of laboratory experimentation.

The horrors that the antivivisectionists portray in experimental laboratories simply do not exist. But since they insist on following this theme of cruelty and agony, here are a few truthful instances—and they could be multiplied, literally, by millions—to which these people might give some attention.

Perhaps they would like to watch a golden haired child of 5 starve to death within a few months, in spite of the most tender care by parents and physicians. That was the almost inevitable fate of child diabetics until the discovery of insulin two decades ago. Insulin was discovered through experiments on dogs. The hundreds of thousands of diabetics whom it enables to lead normal lives are able to take it with safety only because doses are regularly standardized by experiments on other animals.

Or perhaps they would rather see the trapped agony in the eyes of the father of a family who had just been told that he had Addison's disease, an incurable malady that led to death in a short time. Addison's disease is no longer necessarily fatal. It is controlled by cortin, a drug found by experiments on dogs.

Or these self-styled apostles of gentleness might take their stand beside the parents who watch a child stricken with infantile paralysis, not knowing whether the disease will leave the child crippled in mind or body. The convalescent serum that has greatly reduced the fatality and crippling effects of this disease was developed by animal experimentation, which is being continued in the hope of finding a complete cure.

Perhaps they would like to watch the progress of a shambling hulk with a mind arrested in childhood by meningitis. This is one of the many diseases cured by the "miracle drugs" sulfanilamide and its chemical allies. The world would not have them if it had not been for animal experimentation.

Most people have seen a copy of Sir Luke Fildes' famous painting "The Doctor." It shows Queen Victoria's own physician sitting helplessly by in a humble cottage as a little girl chokes her life away with diphtheria. Such scenes were a commonplace in the childhood of the present generation of adults. They are rare today because of the antitoxin and the toxoid immunizing agents prepared in the bodies of horses and tested on other experimental animals.

The horrors of cancer need no elaboration. The search for the agents that cause it depends largely on the use of experimental animals. If the antivivisectionists had their way, that curse would remain on mankind forever.

The list can be extended almost indefinitely. The prevention of smallpox, yellow fever, typhus and lockjaw, the treatment of pneumonia, syphilis, scarlet fever, anemia, bubonic plague, gallbladder ailments and gastric ulcer, new techniques in surgery, the whole range of vitamins and hormones, the marvelous anesthetic ethylene—all these and many other medical discoveries owe their debt to animal experimentation.

If the antivivisectionists are not moved by human suffering, perhaps they would rather watch a shivering, half paralyzed dog that has been stricken by distemper. The vaccines and serums that are 99 per cent effective in preventing or curing distemper were obtained by experiments on dogs. Pasteur experimented on dogs to develop the vaccine that saves both them and men from otherwise certain death from rabies. Experiments on dogs developed tetrachlorethylene as a cure for the hookworm that formerly killed so many pets. It has since been found useful in treating hookworm in humans.

Where does the cruelty lie—in the scientists who humanely use animals to end human suffering, or with the people who by stopping animal experimentation would deny humanity an indispensable weapon against the scourges that still beset it?

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Acts: Revocation of License Without Notice and Hearing Invalid.—A section of the dental practice act of Texas (Vernon's Ann. Civ. St. art. 4549) in general language authorizes the board of dental examiners to suspend or revoke a license to practice dentistry on proof that the licensee has been convicted "for a felony involving moral turpitude." Thereafter the section specifically provides:

Where the cause involves a criminal conviction . . . in some court of competent jurisdiction, the receipt by the Board of a certified copy of the records of the Court of Conviction showing a final conviction shall be sufficient evidence to justify and require such revocation by the State Board of Dental Examiners.

District courts, by other provisions in the section, are authorized, after notice and hearing, to suspend or revoke a license for stated causes other than the causes with respect to which the board has jurisdiction. The board of dental examiners without notice and hearing, revoked the license of Francisco to practice dentistry in Texas "on the ground that he had been convicted of forgery in the State of Oklahoma." The accused dentist then brought suit to require the reinstatement of his license and to cancel the board's order of revocation. From a refusal of the trial court to reinstate his license temporarily pending trial on the merits of the case, he appealed to the court of civil appeals of Texas, Austin.

Francisco contended that the provisions of the section under which his license was revoked were unconstitutional in that they failed "to provide for: (a) notice; (b) hearing; (c) court review; (d) appeal to any court; (e) trial by jury; and (f) notice and hearing before an impartial board or court, and right of appeal and review." The court of civil appeals first held apparently that the order of revocation was invalid because the language of the dental practice act relied on by the board as authority for revoking the license applies only to instances in which a licensee had been convicted of a felony under the laws of Texas and not to out of state convictions. Thus the court did not find it necessary to pass on the constitutional issues raised by the dentist. Subsequently, however, the court held that the language referred to embraced also convictions in other states as well as in Texas and withdrew its former opinion, which seemingly was never published. Under this view the constitutional questions became controlling.

The court first pointed out that the general language giving the board authority to "suspend or revoke" a license was in irreconcilable conflict with the provisions specifically quoted by which "the receipt by the Board of a certified copy of the records of the Court of Conviction showing a final conviction shall be sufficient evidence to justify and require such revocation by the . . . Board," since the general language vested in the Board a discretion to suspend or revoke while the latter made revocation mandatory under the same circumstances. After resolving this conflict in favor of the mandatory language the court went on to discuss the constitutional issues involved.

The practice of dentistry, said the court, relating as it does to the public health, is subject to governmental control. The state has the power to prescribe reasonable regulations for the issue of licenses and may delegate to an administrative board or agency the authority to pass on the qualifications of applicants and to grant or refuse licenses. The state likewise may, for cause, revoke such licenses and may also delegate that function to such board or agency. On the other hand, once the right or privilege to engage in the practice of dentistry has been lawfully acquired, that right or privilege is protected by the due process clauses of the state and federal constitutions.

It is generally conceded, continued the court, that due process includes reasonable notice and the right to be heard. This is true whether the tribunal exercising jurisdiction over rights or privileges protected by the due process clause is a judicial,

legislative, executive or administrative one. The court then quoted from 12 Am. Jur. 307 as follows:

The rule that a hearing before judgment or order is not necessary to due process is especially applicable to proceedings before commissioners and boards, such as public utility commissioners, banking superintendents, etc. There is no violation of due process if provision is made for a trial de novo before a court of the issues passed upon by such a commission, for a judicial review of the order, even a review by mandamus, provision for suspending or setting aside the order, for a hearing before the order is put into effect, or for a rehearing upon application.

However, said the court, even when judicial review of an administrative agency's order is accorded, if no stay of the effect of such order is provided, and if, meanwhile, irreparable injury would result, subjecting the party affected by the order to criminal prosecution for its violation, due process is not satisfied. Tested by these rules, the procedure provided for the revocation of licenses under the provisions of the dental practice act here in question clearly does violence to the invoked constitutional guaranties of due process. No character of notice, hearing or review of the order of revocation is provided. The order operates instantaneously, and the licensee is at once deprived of his right lawfully to practice his profession.

Apparently it was contended that the state had the right to provide for the forfeiture of a license ipso facto on conviction of a felony involving moral turpitude, and that, since the board is not vested with any discretionary powers in the matter, notice and hearing would perform no useful purpose. The answer to this, said the court, if it is otherwise sound, is that the legislature has not provided for an automatic revocation of a license but requires an order of the board. Until an order of revocation is made by the board the license remains in effect. Before the board can act intelligently or properly there are a number of matters it must ascertain. First, it must be shown that the licensee and the defendant in the judgment of conviction is one and the same person. If the conviction was had in another jurisdiction, the following matters must be determined also: (1) the jurisdiction of the convicting court; (2) the sufficiency of the certified record to show a final conviction in the jurisdiction, and (3) whether or not the crime for which a conviction was had is in fact a felony and involves moral turpitude. The licensee is entitled, the court believed, to a hearing on these matters before his license is revoked, and procedure authorizing a summary revocation of a license without such notice and hearing constitutes a denial of due process under both state and federal constitutions.

For the reasons stated the court, in effect, remanded the case to the trial court, instructing it to grant an injunction temporarily reinstating the license pending a trial on the merits of the case. At the same time the court overruled a motion made by the board for a rehearing.—*Francisco v. Board of Dental Examiners*, 149 S. W. (2d) 619 (Texas, 1941).

Society Proceedings

COMING MEETINGS

- American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Hot Springs, Va., Sept. 11-13. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.
- American Association of Railway Surgeons, Chicago, Sept. 8-10. Dr. Daniel B. Moss, 547 West Jackson Blvd., Chicago, Secretary.
- American Congress of Physical Therapy, Washington, D. C., Sept. 1-5. Dr. Richard Kovacs, 2 East 88th St., New York, Secretary.
- American Hospital Association, Atlantic City, N. J., Sept. 15-19. Dr. Bert W. Caldwell, 18 East Division St., Chicago, Executive Secretary.
- Colorado State Medical Society, Estes Park, Sept. 17-20. Mr. Harvey T. Sethman, 537 Republic Bldg., Denver, Executive Secretary.
- Michigan State Medical Society, Grand Rapids, Sept. 16-18. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing, Secretary.
- National Medical Association, Chicago, Aug. 18-22. Dr. John T. Givens, 1108 Church St., Norfolk, Va., General Secretary.
- Northern Minnesota Medical Association, St. Cloud, Aug. 15-16. Dr. Clarence Jacobson, Chisholm, Secretary.
- Oregon State Medical Society, Portland, Sept. 3-6. Dr. M. L. Bridgeman, 1020 S. W. Taylor St., Portland, Secretary.
- Rocky Mountain Medical Conference, Yellowstone Park, Wyo., Sept. 2-4. Mr. W. H. Tibbals, 610 McIntyre Bldg., Salt Lake City, Secretary.
- Washington State Medical Association, Seattle, Aug. 24-26. Dr. Vernon W. Spickard, 1305 Fourth Ave., Seattle, Secretary.
- Wisconsin State Medical Society of, Madison, Sept. 10-12. Mr. G. B. Larson, 110 East Main St., Madison, Assistant Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

21:401-544 (April) 1941

- Coronary Embolism. L. Hamman, Baltimore.—p. 401.
Blood Volume and Cardiovascular Adjustments. H. C. Bazett, Philadelphia.—p. 423.
Roentgenologic Studies of Size of Heart in Childhood: I. Three Different Types of Teleroentgenographic Changes Which Occur in Acute Rheumatic Fever. Helen B. Taussig and M. Goldenberg, Baltimore.—p. 440.
Metastatic Bronchiogenic Carcinoma of Heart: Report of Case, with Clinical Diagnosis by Progressive Electrocardiographic Changes and Pathologic Confirmation. J. R. Reuling, Bayside, N. Y., and L. Razinsky, Far Rockaway, N. Y.—p. 470.
Circulatory Effects Following Intravenous Administration of Pitressin in Normal Persons and in Patients with Hypertension and Angina Pectoris. A. Graybiel and R. E. Glendy, Boston.—p. 481.
Effect of Short Wave Diathermy on Cutaneous Temperatures of Feet. R. L. Bennett, E. A. Hines Jr., and F. H. Krusen, Rochester, Minn.—p. 490.
Crystal Microphone for Pulse Wave Recording. A. Miller and P. D. White, Boston.—p. 504.
Circulatory Adjustments in Polycythemia Vera. H. J. Stewart, C. H. Wheeler and N. F. Crane, New York.—p. 511.

American Journal of Clinical Pathology, Baltimore

11:263-360 (April) 1941

- *Hemorrhagic Diathesis: Review of 310 Cases. R. L. Haden and R. W. Schneider, Cleveland.—p. 263.
Histopathology of Liver Following Superficial Burns. L. J. Buis and F. W. Hartman, Detroit.—p. 275.
Preparation and Preservation of Human Plasma: II. Drawing Off, Pooling and Distribution of Plasma. M. M. Strumia and J. J. McGraw, Bryn Mawr, Pa.—p. 286.
Studies on "Stored Blood": I. Technic for Storage Blood. R. O. Muether and K. R. Andrews, St. Louis.—p. 307.
Id.: II. Effect of Storage on Human Blood. R. O. Muether and K. R. Andrews, St. Louis.—p. 314.
Id.: III. Effects of Stored Blood on Recipient. R. O. Muether and K. R. Andrews, St. Louis.—p. 321.
Serum Antistaphylococcal Weisser During Antitoxic Therapy of Staphylococcal Infections. C. Weiss, San Francisco.—p. 329.
Histoplasmosis in Infancy: Report of Case. W. A. D. Anderson, I. D. Michelson and T. M. Dunn, St. Louis.—p. 344.

Hemorrhagic Diathesis.—Haden and Schneider studied the blood of 310 patients presenting abnormal bleeding. In 119 purpura was the indication for the study, in 116 it was gross hemorrhage (epistaxis, hematuria, melena and extensive ecchymoses) without a local lesion explaining the bleeding or the hemorrhage was out of proportion to the injury or local disease, while the remaining 75 patients fell into a number of small groups (jaundice, preoperative and postoperative hemorrhage, hemophilia, thrombasthenia and so on). A disturbance in the clotting factor was demonstrable in only 132 of the 310 patients, suggesting that the vascular defect (increased permeability of the walls of the vessel) is more important than the clotting defect in clinical pathologic hemorrhage. The purpuras were subdivided into those with and those without platelet deficiency to explain the abnormal bleeding. The thrombopenic purpuras were further divided into the idiopathic and the secondary type. The 1 patient, among the 19 in the idiopathic group, with a platelet count of 120,000 showed clot retraction; in all the others (with counts from 90,000 to 50,000) clot retraction was absent. The bleeding time was abnormally prolonged in all except the 1 patient with the highest platelet count. In 7 patients of this group the coagulation time was prolonged although never greatly so. From this it is evident that the vascular permeability component of the platelets was lacking in all, while the

thromboplastin factor was lacking in a few. The results were much the same in the symptomatic thrombopenia group, although the platelet count of 4 patients was above 100,000, all of whom showed clot retraction. The bleeding time of only 2 was not prolonged. The coagulation time of 19 was prolonged. The most common causes for the secondary thrombocytopenia were leukemia, aplastic anemia, congestive splenomegaly (Banti's syndrome), drugs and infections. In 74 patients purpura was present in the absence of deficiency of platelets. Most important in purpura were allergy, rheumatic disease and renal disease. The blood of 35 of these showed no abnormality except a slightly prolonged coagulation time in 3 patients. The coagulation time of 12 of the remaining 39 was prolonged; no other abnormality was observed. The bleeding time was never prolonged significantly in the absence of a platelet deficiency, and clot retraction was always present. In this group the bleeding was evidently not due to a demonstrable thromboplastin deficiency, as the platelets were not decreased. Some other factor apparently determined the increased vascular permeability. The only observation among the 116 patients presenting a gross hemorrhage unexplained by a local lesion was a prolonged coagulation time in 36. The coagulation time was from fifteen to twenty minutes in most instances; in 4 it was longer than twenty minutes. This observation might explain the abnormal bleeding. A deficiency in thromboplastin has been excluded by the presence of a normal number of platelets unless a qualitative defect is present. It is conceivable that there may be a qualitative defect in the platelets. Anticoagulants were tested for and no deficiency of prothrombin was found. The mechanism of the prolonged coagulation time in the absence of a platelet deficiency is not clear. Most of the jaundiced patients were studied before adequate determination of prothrombin was available. It is now evident that a deficiency of prothrombin is the cause for the prolonged coagulation. The platelets and clot retraction were always normal. The hemophilia patients showed the characteristic prolonged clotting time with a normal platelet count and clot retraction. The patients with thrombasthenia presented thrombopenic bleeding without a decrease in platelets. Their coagulation and bleeding time was prolonged but the clot retraction was normal. Two patients were mother and son.

Annals of Surgery, Philadelphia

113:481-640 (April) 1941

- Endemic Goiter in Japan. K. Kawaisbi and Y. Hashimoto, Taihoku, Formosa, Japan.—p. 481.
Surgery of Thyroid in a Large Municipal Hospital. R. V. Grace and C. Weeks, New York.—p. 496.
*Branchial Cysts and Sinuses. F. H. Lahey and H. F. Nelson, Boston.—p. 508.
*Intra-Abdominal Apoplexy. J. E. Berk, N. S. Rothschild and J. C. Doane, Philadelphia.—p. 513.
Intractable Gastric Ulcer with Final Malignant Change Associated with Benign Tumor of Brain. P. H. T. Thorlakson and Sarah Melzer, Winnipeg, Man., Canada.—p. 521.
Giant Diverticulum or Duplication of Intestine with Recurrent Perforations. J. W. Duckett, Dallas, Texas.—p. 528.
Topography and Development of Cecum-Appendix. C. F. De Gans, Oklahoma City.—p. 540.
Benign Tumors of Ovary Associated with Ascites and Pleural Effusion: Report of Case of Multilocular Cystadenoma. W. F. MacFee, New York.—p. 549.
Studies on Cerebrospinal Fluid Pressure in Unanesthetized Dogs. J. E. Webster and N. E. Freeman, Philadelphia.—p. 556.
Induction of Liver Necrosis in Rabbits by Combination of Experimental Hyperthyroidism and Shope Papilloma. W. C. Sealy, Durham, N. C.—p. 572.
Perineal Prostatotomy and Prostatectomy for Removal of Prostatic Calculi. R. Gutierrez, New York.—p. 579.
Hydrocele of Canal of Nuck: Report of Seventeen Cases. V. S. Counsellor and B. M. Black, Rochester, Minn.—p. 625.

Branchial Cysts and Sinuses.—Lahey and Nelson report 27 cases of branchial cysts and sinuses in which operation was performed during the last ten years. Wenglow's theory as to the etiology of branchial cysts and sinuses, as interpreted by Meyer, is generally accepted. Wenglow's theory formulated that the branchial apparatus begins to take place in the third and fourth weeks of embryonic life and disappears during the second month. The branchial apparatus extends forward, upward and orally and the pharyngeal apparatus posteriorly downward and below the mouth. The arches grow closer in embryonic life until the cleft disappears and the epithelium is displaced out-

ward by the mesenchymal growth or by adhesion and obliteration. The first arch forms the lateral portion of the upper lip and maxilla, the lower lip and mandible and the tongue; the second arch the hyoid bone, the stylohyoid ligament and muscle, the anterior base of the tongue and the arcus palatoglossus, and the third arch the greater cornu of the hyoid bone, the posterior base of the tongue and the arcus pharyngopalatinus. The fourth, fifth and sixth arches make up the soft parts of the neck surrounding the greater cornu of the hyoid. The first cleft forms the external auditory canal and the lobe of the ear, the second cleft the tonsillar fossa, the third cleft the thymus and the fourth cleft the lateral lobes of the thyroid. Meyer believes that the branchial apparatus belongs to the head and not the neck and that any congenital pathologic condition must rest along the mandible adjacent to the hyoid bone and the cornu of the hyoid bone. Any congenital anomaly below the lower border of the hyoid bone must be classified as a lateral cyst or fistula originating from the pharyngothymic duct. The condition is usually found in young people, predominantly in females. Fifty-six per cent of the authors' patients were less than 30 years of age and 70 per cent were females. The usual symptoms attributed to branchial cysts and sinuses are a tumor of the neck, a sinus with an intermittent or continuous discharge of secretion and recurrent attacks of inflammation, and occasionally an unexplained cough. The duration of symptoms of the present group varied from three days to twenty years, the average being four and a half years. Only 57 per cent of the cysts were diagnosed before operation. Many conditions which are common in the neck must be considered: dermoid cysts, cystic hygromas, lipomas, thyroglossal cysts and sinuses, tuberculous adenitis and sinuses, venous hemangiomas, deep cervical abscesses, actinomycosis, Hodgkin's disease, lymphosarcoma, lymphatic leukemia, carotid body tumors and various cervical metastatic neoplasms. Branchial sinuses and cysts occur with about equal frequency on the two sides of the neck; 56 per cent in the authors' series were on the right and 40 per cent on the left. In 1 case there were bilateral fistulas. Various types of treatment have been reported. Most surgeons advocate complete excision of the sinus tract or cyst. Recurrence has not taken place in any of the 27 cases following complete surgical excision.

Intra-Abdominal Apoplexy.—According to Berk and his co-workers, the term "intra-abdominal apoplexy" aptly describes the spontaneous occurrence and nature of the condition, a spontaneous rupture of an intra-abdominal blood vessel independent of direct trauma to the abdomen. An exhaustive study of the literature reveals only 19 such cases, to which the authors add a case of their own. Analysis of the 20 cases reveals that the accident occurred in an approximate ratio of 3 males to 1 female whose ages varied from 27 to 73 years, with the greatest frequency between 45 and 55 years of age. Ten patients had evidence of a definite hypertension, and in 2 others marked arteriosclerosis was found at postmortem. No definite bleeding point could be found in 6 of the younger patients (average age 41.5 years, or ten years less than the average for the entire group). In 4 of these 6 the cardiovascular state was apparently normal. Of the 5 patients with an apparently normal cardiovascular state no definite bleeding point could be found at operation or at postmortem examination in 4. The practical implication of the close association between age, occurrence, a relatively normal cardiovascular apparatus and no bleeding point becomes more apparent when the operative results are analyzed. Sixteen of the 20 patients were operated on and 11 recovered. Of the 5 who died, 4 had no definite bleeding point. It would seem that, despite the occurrence of a massive intraperitoneal hemorrhage, if a definite bleeding point can be located at operation and the bleeding vessel ligated the chance of recovery is excellent. In no instance was a correct diagnosis made prior to operation. Perforated peptic ulcer was generally suspected. All cases were considered as acute abdominal catastrophes, but an abdomen full of blood was a distinct surprise. Scrutiny of all the symptoms and signs reveals nothing pathognomonic of the condition. Only the absence of gross trauma, dominant digestive complaints or previous similar occurrences are of some aid in the differential diagnosis. The condition should be con-

sidered whenever there occur sudden severe abdominal pain, shock and signs of peritoneal irritation especially in a known hypertensive person. The high incidence (60 per cent) of hypertension and arteriosclerosis in the reported series suggests that local disease of the blood vessels must be the basic, underlying factor. A recent report by Morlock tends to substantiate such a conclusion. He demonstrated that the blood vessels of the gastrointestinal tract of hypertensive persons of all ages, as compared to normal persons, showed measurable thickening of the arteriolar wall and reduction of the ratio of wall to lumen. In such blood vessels, hyperplasia of the nuclear elements of the media occurred early, to be followed later by degeneration and fibrosis. The spontaneous feature is an important one. The precipitating cause is in most instances hidden and unexplainable. Given a basic, underlying local disease or congenital defect, anything tending to raise the intravascular pressure within that diseased or defective vessel might result in a rupture at the weakened site. Hypertension, the use of pitressin, sudden emotional strain, excessive eating, coitus or heavy lifting might well predispose to a "blowing out" of a blood vessel.

Archives of Pathology, Chicago

31:411-532 (April) 1941

- Cutaneous Carcinoma: I. Statistical Analysis with Respect to Duration and Size of Tumors and Age of Patients at Onset and at Biopsy of Tumor. R. Schrek, Hines, Ill., and Olive Gates, Boston.—p. 411.
Id.: II. Statistical Analysis with Respect to Measures of Innate and Clinical Malignancy. R. Schrek, Hines, Ill.—p. 422.
Id.: III. Statistical Analysis with Respect to Site, Sex and Pre-existing Scars. R. Schrek, Hines, Ill.—p. 434.
*Medial Coronary Sclerosis in Infancy. C. E. Brown and Ina M. Richter, Santa Barbara, Calif.—p. 449.
Relation of Concentration of Red Blood Cells to Sensitivity of Isoagglutination Reaction: Its Importance in Demonstration of Agglutinin in Dried Blood Stains. H. Lund, Boston.—p. 458.
*Hypertrophy and Hyperplasia of Islets of Langerhans of Fetus and of Newborn Infant. Edith L. Potter, H. P. G. Seckel and W. A. Stryker, Chicago.—p. 467.
Anatomic and Behavior Changes Produced by Partial Hepatectomy in Rat. E. C. H. Schmidt Jr. and C. P. Richter, Baltimore.—p. 483.
Tissue Anomalies of Probable Neural Crest Origin in a Twenty Millimeter Human Embryo with Myelosis. F. Gruenwald, Chicago.—p. 489.
Interpapillary Glomerulosclerosis. P. A. Herbut, Philadelphia.—p. 501.
Relation of Chemical Composition of Lipids to Characteristic Tissue Lesions. E. F. Hirsch, Chicago.—p. 516.

Medial Coronary Sclerosis in Infancy.—Brown and Richter cite the 6 cases of medial coronary sclerosis gleaned from the literature and 1 of their own. The cases are clinically important because of ischemic phenomena apparent in the myocardium with which the coronary lesions were associated, as judged by clinical signs in some cases and by microscopic sections in others. The 7 cases do not include instances of arterial calcification in infants in which the coronary arteries were not mentioned nor visceral calcification in infants in which the general arterial system was uninvolved or not mentioned. The arterial changes in the 6 cases were essentially the same as those in the authors' case except that in some the calcifications involved the aorta and its major branches in addition to the coronary arteries. The patient, a boy born of a healthy primiparous 21 year old mother, developed normally and gained weight up to a week before death at the age of 3½ months. On the night before death he suddenly became dyspneic and cyanotic and vomited once. When admitted to the hospital he was alternately pale and cyanotic, the respirations were rapid and the heart sounds were too rapid to count. Epinephrine and codeine appeared to give slight relief, but after two short tonic convulsions the child died, less than twenty-four hours after the onset of symptoms. A postmortem examination was made two and one-half hours after death. The external appearance was entirely normal. The pericardium was normal. The heart, particularly the right ventricle, appeared slightly enlarged. The epicardium was smooth, the myocardium was pale and the endocardium displayed superficial smooth white streaks. On the line of closure of the mitral and tricuspid leaflets there were occasional minute smooth blood-stained elevations. The coronary arteries appeared more prominent and tortuous than usual but were not sufficiently abnormal to excite suspicion. The ribs, vertebrae, extremities and internal organs appeared to be

normal. The mesenteric lymph nodes were soft and gray. The coronary arteries and their major branches were characterized by disruption and calcification of the internal elastica, edema and fibroblastic proliferation of the intima and atrophy of the muscle fibers of the media. The changes were most advanced in the circumflex branch. In a section of the left anterior descending branch the internal elastica could be identified as an irregularly thickened band on which calcium appeared encrusted. Wandering cell infiltrations were at a minimum. The lesions on the mitral and tricuspid valves were made up of ectatic capillaries. The endocardium, particularly in the auricles, was thickened. In most of the renal glomeruli the cells of the capillary loops were swollen and the lumens scanty. The epithelium of the convoluted tubules was swollen. About a fifth of the internal elastica and media of an arcuate artery seen in longitudinal section showed calcification. The elastica in the involved portion was irregularly thickened, and the muscle fibers of the media were opaque and blue. Similar changes were observed in a small adrenal artery in the pericapsular fat. The alveolar spaces of the lung were partially obliterated by apparent collapse of their walls. The spleen, liver and thymus were normal. In the absence of inflammatory or obstructive renal changes, or of gross osseous abnormalities, mention is made of the possibility of primary hyperparathyroidism, alteration of the calcium-phosphorus balance from the administration of viosterol to the mother and child or some innate degenerative arterial change in the child. The authors' data on the use of viosterol are not sufficiently complete to exclude this possibility, but it is unlikely. The amount of vitamin D given to this infant and to the one seen by Lightwood is not comparable to the doses given experimentally to produce similar lesions in animals. The cause of the lesion is in doubt, although some alteration in the calcium and phosphorus metabolism is suspected.

Hypertrophy and Hyperplasia of Islets of Langerhans.—Potter and her associates found instances of hypertrophy and hyperplasia of the islet tissue of pancreases of infants born to nondiabetic mothers. The almost universal acceptance that the phenomenon is due to maternal diabetes suggested the desirability of reviewing cases found in the literature, as well as of the 14 encountered by them. Their cases, with a single exception, were discovered during routine microscopic examination of 450 pancreases from nonmacerated fetuses, premature infants and infants born at term examined post mortem. The necropsy series included 4 infants born of diabetic mothers and 22 infants suffering from erythroblastosis. The cases fall into four groups. Group A consists of 24 previously and 2 newly reported cases in which the mothers were stated to have been diabetic; group B of 3 infants (1 observed by the authors) whose mothers may have had diabetes; group C of 16 infants whose mothers had no clinical evidence of diabetes during pregnancy, and group D 10 infants without associated erythroblastosis (2 cases previously reported) and 6 infants with erythroblastosis (3 cases previously reported). In most of the cases there was no correlation between the increase of islet tissue and the severity of diabetes, the state of control or the change in sugar tolerance of the mother during pregnancy. There is also little correlation between the amount of islet tissue found at necropsy and the blood sugar levels before death of those infants who died during the neonatal period. The authors conclude that an increase in fetal islet tissue may be found in the presence or absence of abnormal sugar metabolism in the mother or the infant.

Arkansas Medical Society Journal, Fort Smith

37:255-276 (May) 1941

X-Ray Examination in Ileus and Intestinal Obstruction. I. H. Lockwood, Kansas City, Mo.—p. 255.

Bulletin New York Academy of Medicine, New York

17:325-402 (May) 1941

Oliver Wendell Holmes: Precursor of Freud. C. P. Oberndorf, New York.—p. 327.
Newer Conceptions of Postinfectious and Related Forms of Encephalitis. T. J. Putnam, New York.—p. 337.
Thrombophlebitis. I. S. Wright, New York.—p. 348.
Newer Knowledge of Blood Transfusions. J. Scudder, C. R. Drew, Elizabeth Tuthill and Margaret E. Smith, New York.—p. 373.

Canadian Public Health Journal, Toronto

32:143-230 (April) 1941

Milk: The Protected, Protective Food. E. W. McHenry, Toronto.—p. 143.
Consumption of Milk in Canada. W. C. Hopper, Ottawa, Ont.—p. 147.
Milk Consumption in the Vancouver Metropolitan Area. J. S. Kitching, Vancouver, B. C.—p. 154.
Educational Program to Raise Nutrition Levels Through Increased Milk Consumption. M. Frances Hucks, Toronto.—p. 158.
Production of Clean Milk. A. R. B. Richmond, Toronto.—p. 163.
Tests for Milk Quality. C. K. Johns, Ottawa, Ont.—p. 169.
Transmission of Animal Diseases to Man Through Milk. M. P. Ravenel, Columbia, Mo.—p. 174.
Present Status of Milk-Borne Disease Hazards. C. E. Dolman, Vancouver, B. C.—p. 183.
Contagious Abortion of Cattle and Undulant Fever in Man. J. S. Fulton, Saskatoon, Sask.—p. 194.
Engineering Features of Pasteurizing Plants and Equipment. G. A. H. Burn, Toronto.—p. 199.
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Phosphatase Test. P. J. Moloney, Toronto.—p. 213.

Cancer Research, Philadelphia

1:259-344 (April) 1941. Partial Index

Occurrence and Pathology of Spontaneous Carcinoma of Lung in Mice. H. G. Wells, Maud Slye and Harriet F. Holmes, Chicago.—p. 259.
Production of Tumors by Tobacco Tars. C. M. Flory, Chicago.—p. 262.
Studies on Prostatic Cancer: I. Effect of Castration, of Estrogen and of Androgen Injection on Serum Phosphatases in Metastatic Carcinoma of Prostate. C. Huggins and C. V. Hodges, Chicago.—p. 293.
Failure to Find Carcinogens in Urine from Patients with Cancer. R. O. Bowman and H. R. Mottshaw, Providence, R. I.—p. 308.
Glucose Tolerance Test in Its Relation to Cancer. G. L. Rohdenburg, New York.—p. 311.
Fate of Spontaneous Mammary Carcinomas in Mice After Simple Biopsy. R. Lewisohn, C. Leuchtenberger, R. Leuchtenberger and D. Laszlo, New York.—p. 324.

Connecticut State Medical Journal, Hartford

5:241-316 (April) 1941

Thrombophlebitis, with Particular Reference to Treatment. H. Mahorner, New Orleans.—p. 243.
Connecticut Medical Bibliography. W. R. Steiner, Hartford.—p. 248.
Nature and Treatment of Epilepsy. T. J. Putnam, New York.—p. 257.
Symptoms Compelling Attention to Heart. L. H. Nahum and P. Piccolo, New Haven, Conn.—p. 261.
Conservative Treatment in Fractures of Neck of Humerus. J. J. Moorhead, New York.—p. 267.
Survey of Anesthesia Service at Grasslands Hospital, 1938 to 1940. H. F. Bishop, Valhalla, N. Y.—p. 270.

Journal of Aviation Medicine, St. Paul

12:1-112 (March) 1941

Combined Electrocardiography, Stethography and Cardioscopy in Selection of Pilots. W. M. Bartlett, Benton Harbor, Mich., and J. B. Carter, Chicago.—p. 2.
*Effect of Low and High Oxygen Tensions on Mental Functioning. A. L. Barach, New York.—p. 30.
Mask Apparatus Which Provides High Oxygen Concentrations with Accurate Control of Percentage of Oxygen in Inspired Air and Without Accumulation of Carbon Dioxide. A. L. Barach and M. Eckman, New York.—p. 39.
Recent Trends in Aviation Medicine. J. R. Poppen.—p. 53.
Civil Aeronautics Medical Forum. W. R. Stovall, Washington, D. C.—p. 72.

Effect of Oxygen Tension on Mental Functioning.—Barach compared the effects of low and high oxygen concentrations on the mental activity of 17 medical students and 9 psychoneurotic patients. The subjects breathed an atmosphere of 13 per cent oxygen (equivalent to an altitude of 12,400 feet) for three hours. Impairment of emotional control was demonstrated in all 17 students. In 50 per cent elation and overconfidence were first manifested; these conditions were followed by headache and lethargy. In 41 per cent mental dulness continued throughout the experiment with headache at its termination. The patients showed a more pronounced lack of emotional restraint, exaggerated self esteem and inability of inhibiting instinctive drives. The mood of 5 patients changed from a hypomanic state to dulness and lethargy, and 4 patients had dulness and apathy from the beginning. A phenomenon not generally recognized is that inhalation of 50 per cent oxygen in patients with a previously existing chronic anoxia may temporarily produce a profound disturbance in mental functioning. This is likely to occur especially in cases of pulmonary emphysema and pulmonary fibrosis in which the arterial oxygen

saturation has been lowered over a long period. Deep sleep and stupor occurred, followed in some instances by coma and delirium. Milder manifestations were headache, depression and a variable degree of irrationality. When the patients became acclimatized to the increased oxygen tension the mental disturbance disappeared and was followed by a cheerful and optimistic mood. In most instances the duration of the disorder produced by inhaling 50 per cent oxygen lasted for from two to four days; in 1 a deep sleep verging on coma lasted for seven days. Inhalation of high oxygen atmospheres did not alter the mental function of normal subjects.

New England Journal of Medicine, Boston

224:533-582 (March 27) 1941

- Acute Cholecystitis. R. Zollinger, Boston.—p. 533.
Causes of Indigestion and Their Recognition. T. G. Miller, Philadelphia.—p. 537.
Unusual Case of Subdural Hematoma. J. T. B. Carmody, Worcester, Mass.—p. 541.
Pharmacologic and Clinical Reevaluation of Amphetamine (Benzedrine) Sulfate. W. M. Cameron and J. Kasanin, San Francisco.—p. 544.
Encephalopathy Following Neosphenamine Therapy. E. Roseman and C. D. Aring, Cincinnati.—p. 550.
Tuberculosis. D. S. King, Brookline, Mass.—p. 554.

224:627-672 (April 10) 1941

- Convalescent Care of Children with Heart Disease Due to Rheumatic Fever: Survey of Problem of Care of Children with Rheumatic Heart Disease. P. D. White, Boston.—p. 627.
Rheumatic Fever in Childhood, with Especial Reference to Five Year Study of Home and Foster-Home Care. E. F. Bland, Boston.—p. 629.
Medical-Social Program for the Child with Rheumatic Fever. Edith M. Terry, Boston.—p. 632.
Social Services to Children with Rheumatic Fever. Virginia B. Ebert, Boston.—p. 634.
Pseudocystitis. R. N. Rutherford, Boston.—p. 639.
Management of Preeclampsia. F. L. Adair, Chicago.—p. 644.
Etiology and Treatment of Urticaria: Diagnosis, Prevention and Treatment of Poison Ivy Dermatitis. P. C. Baird Jr., Boston.—p. 649.

224:673-710 (April 17) 1941

- Mycotic Infections of Skin. O. S. Ormsby, Chicago.—p. 673.
Development of the Concept of Hypertensive Heart Disease. D. Davis and M. J. Klainer, Boston.—p. 679.
Pulmonary Fibrosis in Raynaud's Disease. H. Linenthal and R. Talkov, Boston.—p. 682.
Allergy, with Special Reference to Drug Allergy. F. M. Rackemann, Boston.—p. 688.

224:711-754 (April 24) 1941

- *Tuberculous Infection Among Nurses and Medical Students in Sanatoriums and General Hospitals. P. Dufault, Rutland, Mass.—p. 711.
Hematoma of Brain. P. J. Buckley and J. M. McKinney, New York.—p. 716.
Hypothyroidism in Infants and Children, with Reference to Ultimate Prognosis Concerning Intelligence and to Withdrawal of Thyroid Therapy as Diagnostic Measure. R. P. Goodkind and H. L. Higgins, Boston.—p. 722.
Acute Laryngeal Obstruction as Complication of Measles. H. H. Shuman, Fitchburg, Mass.—p. 727.
Hematology. W. Dameshek, Boston.—p. 729.

Tuberculosis Among Nurses and Medical Students.—Dufault states that reports appearing before 1925 claimed that the incidence of tuberculosis among nurses, medical students and physicians was not higher than among the general population. The literature after 1925 and his own observations indicate a higher morbidity rate among the nursing personnel. Infection of medical students has come to the attention of epidemiologists. A wealth of material has been accumulated in various medical schools in this country and abroad indicating that the morbidity rate from tuberculosis among the second, third and fourth year medical students is higher than that among other young men and women of the same age group. A recent report by Hedvall from Lund University, Sweden, gives the highest as yet officially reported infection rate among this group. The most enlightening part of Hedvall's report is the tracing of the main source of infection to the necropsy room. Samples from towels, trays and tables twenty-four hours after a necropsy contained tubercle bacilli on cultures, in spite of all precautions during the postmortem procedure. That the danger of contamination from this source may be serious is further demonstrated by data obtained from various hospitals in Massachusetts. In 3,766 postmortems at the Boston City Hospital tuberculosis was found to be the primary or contributory cause of death in 285 cases, a rate of 7 per cent for 1935

to 1939 inclusive. The Worcester State Hospital reported a 6 per cent rate for 1937 and 1938. In the same year the Worcester Hahnemann Hospital had 3.8 per cent, the Worcester Memorial Hospital 2.7 per cent and St. Vincent Hospital 1.5 per cent. From the Worcester City Hospital comes the surprisingly low figure of 0.9 per cent for the years 1934 to 1938 inclusive. At the Buffalo General Hospital and Children's Hospital Terplan reported that the incidence of tuberculous lesions at the necropsy of about 700 children and young adults was 5.9 per cent among those younger than 7 years and 19.4 per cent among those between 7 and 18 years. The percentage of tuberculous foci found in the necropsy room of general hospitals indicates that there may be more lesions in the wards than are suspected. Of 65,000 deaths from tuberculosis in the United States in 1933 to 1934, 5,306 (7 per cent) occurred in tuberculosis departments of general hospitals. In a recent roentgen survey of 4,853 patients admitted at fifteen representative general hospitals, Plunkett and Mikol found 2.6 per cent with pulmonary tuberculosis. This explains some seemingly paradoxical reports of a higher incidence of tuberculosis among nurses in general hospitals than among those at tuberculosis sanatoriums. There is less contact in the former institutions, but that contact is more dangerous because it is not recognized and precautions are not taken. From the study of a few cultures of tubercle bacilli grown from the sterile water used to wash bed sheets, tables, walls and floors of rooms of tuberculous patients the author finds that tubercle bacilli are present in the immediate vicinity of tuberculous patients, and that their number increases with the stage of the disease, the severity of the cough and the lack of precaution taken by the patient. The author states that the change in the status since 1925 has been brought about by roentgenologic studies. The morbidity was probably as high in the twenty-five preceding years but clinically it was not recognized soon enough to be associated with the source of infection. Cutaneous testing has been an even more sensitive gauge than the roentgen rays in determining the rate of infection among nurses and students.

New Jersey Medical Society Journal, Trenton

38:159-210 (April) 1941

- Treatment of Peptic Ulcer, with Emphasis on Precipitating Factors. J. Gerendasy, Elizabeth.—p. 161.
Syphilis of Thoracic Aorta. J. E. Higi, Newark.—p. 166.
Mental Hygiene and the General Hospital. H. A. Davidson, Newark.—p. 173.
Responsibility of the Physician. E. W. Sprague, Newark.—p. 176.
Management of Infected Tonsils, Teeth and Sinuses in Arthritis. J. W. Gray, Newark.—p. 178.
Trauma Associated with Malignancy. L. J. Levinson and N. J. Furst, Newark.—p. 181.
Respiratory Allergy: Practical Points in Diagnosis and Treatment. J. A. Clarke Jr., Philadelphia.—p. 184.
Functional Disturbances of Gastrointestinal Tract. E. Weiss, Philadelphia.—p. 185.

New Orleans Medical and Surgical Journal

93:491-542 (April) 1941

- David French Boyd, a Louisiana Educator. W. D. Postell, New Orleans.—p. 491.
Surgical Treatment of Detachment of Retina. W. R. Buffington, New Orleans.—p. 495.
Hypertension as Symptom of Renal Failure: Review of Recent Literature. R. H. Bayley, New Orleans.—p. 500.
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Studies with Antigens: IX. Treatment with Purified Extracts of House Dust. B. G. Efron, C. H. Boatner and P. Everett, New Orleans.—p. 514.
Sulfanilamide and Sulfapyridine: Pharmacology and Toxicology. E. E. Nelson, New Orleans.—p. 516.
Exfoliative Dermatitis from Solisminol Mass by Mouth: Case Report. C. S. Hargrove, Baton Rouge, La.—p. 519.
Postparturient Infection with Probable Endocarditis, Pulmonary Infarction, Cerebral Embolism and Bilateral Thrombophlebitis of Internal Saphenous Veins: Report of Case with Recovery. H. T. Enkelhardt and O. J. LaBarge, New Orleans.—p. 520.
Spontaneous Mediastinal Emphysema. E. Matthews, New Orleans.—p. 523.
Management of Strychnine Poisoning: Case Report of Recovery Following Ingestion of 0.325 Gm. D. C. Browne and G. McHardy, New Orleans.—p. 525.

New York State Journal of Medicine, New York

41:643-802 (April 1) 1941

- Urology in the Young: Pediatrician's Role. M. F. Campbell, New York.—p. 671.
 Conservative Surgery in Treatment of Recurrent Salpingitis. H. C. Falk, New York.—p. 675.
 Sarcoma of Uterus. F. R. Smith, New York.—p. 681.

41:803-914 (April 15) 1941

- Renal Function Tests. D. D. Van Slyke, New York.—p. 825.
 Study of Primary Staphylococcal Pneumonias Occurring at the Rochester General Hospital. I. A. Gáspár, Rochester.—p. 834.
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 Avitaminosis A: Incidence in Group of 100 Hospitalized Children as Measured by the Biophotometer. H. G. Rapaport and Dorothy Greenberg, New York.—p. 879.
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41:915-1026 (May 1) 1941

- *Neurosurgical Approach to Epilepsy. J. E. Scarff, New York.—p. 939.
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 Urologic Study of Diabetic Women: Report on Associated Findings of Hypertension. N. Kutzman, E. M. Watson and B. D. Bowen, Buffalo.—p. 957.
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 Ileocolostomy with Exclusion in Treatment of Regional Ileitis. R. Colp and L. Ginzburg, New York.—p. 982.
 Physical Examination of School Personnel. E. H. Ormsby, Amsterdam, N. Y.—p. 991.

41:1027-1122 (May 15) 1941

- Preparing the Disabled Worker for Reemployment: Role of Physical Therapy in Early Treatment of the Injured Workman. Madge C. L. McGuinness, New York.—p. 1049.
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 Management of Gross Hemorrhage in Peptic Ulcer: Report of 168 Cases. H. L. Segal, W. J. M. Scott, Rochester, and R. S. Stevens, Chicago.—p. 1074.
 Papillary Carcinoma in Horseshoe Kidney: Case. J. S. Fitzgerald, Utica.—p. 1081.
 Tumors of Bladder. H. G. Bugbee, New York.—p. 1085.

Neurosurgical Approach to Epilepsy.—Scarff points out that convulsions are no longer regarded as a disease but as a symptom or sign of a number of diseases. A convulsion indicates either a pathologically irritable or irritated brain, and the contributing factors are numerous and diverse. The essential diagnostic problem in any convulsion is to determine whether the disorder is the result of a diffuse pathologic process causing a generally irritable brain or whether it is caused by a focal process. The former is a strictly medical problem, whereas in many instances of the latter only surgical intervention may prove successful. Focal convulsions are indisputable evidence of a discrete, localized, irritative lesion of the brain. The classic example is the so-called jacksonian fit. However, general convulsions do not rule out a focal lesion. They are frequently produced by sharply localized lesions, cerebral tumors for example. All the available sources of focal data should be examined in every case of epilepsy. Various minor and major procedures may aid in determining focalizing features which

are not apparent at first. The minor diagnostic considerations include the age of the patient, the type of the early convulsions, whether the attacks are abortive or incomplete, the existence of the aura or warnings, the initiating phase in any given attack, the postconvulsive sequelae or residual symptoms and signs, symptoms or signs referable to the central nervous system associated with the convulsions, active pathologic processes elsewhere in the body, trauma preceding the onset of epilepsy, careful neurologic examination, study of blood chemistry, roentgen examination for depressed fractures or erosions, hyperostoses or vascular anomalies of the bone, electroencephalography and pneumoencephalography. The major diagnostic procedures are craniotomy with visual inspection of the cortex, electrocorticograms and electrical stimulation of the exposed cortex in search of a "trigger area." Diagnosis of "idiopathic epilepsy" is permissible only when (1) the disease first appears during infancy or early childhood and (2) when no evidence of a specific or focalized etiology can be obtained by any of the foregoing methods of study. Even then the diagnosis should be made with mental reservation for, as a result of improved methods and a revival of interest, many cases of epilepsy that would have been regarded as "idiopathic" (and hence incurable) twenty years ago are today being shown to result from a localized, specific lesion for which surgery offers a favorable prognosis. Patients with convulsive disorders should be admitted to a neurologic hospital and the minor and probably major diagnostic procedures applied. At their completion patients can be divided into three categories: (1) Patients with no focal or localizing symptoms or signs are to be treated medically, (2) those with gross anatomic lesions in the brain determined by clinical examination or pneumoencephalography are unquestionably surgical candidates and (3) patients showing evidences of focal lesions which are irritative but not grossly anatomic are to be treated surgically only when all medical measures have failed. Surgery is indicated if the attacks are socially or economically incapacitating, if they are in any way focal, and if medical therapy has failed to control them. Post-operative results (8 illustrative cases) permit certain generalizations: 1. The more definitely and grossly anatomic the focal lesion that causes the convulsion, the more successful, as a rule, is the result following its removal. Patients with depressed fractures and cortical cicatrices which are visible in the pneumoencephalogram have a good chance of complete and permanent cure. Convulsions due to tumors almost completely disappear on the removal of the offending growth. 2. Few patients in whom the focal lesion was essentially physiologic rather than anatomic have been completely cured by operative measures. However, they have shown varying degrees of improvement. The basic cause of convulsions in these patients is probably a constitutionally low threshold for all forms of irritation, and the various focal points found and treated at operation probably represent secondary "release mechanisms."

Ohio State Medical Journal, Columbus

37:305-408 (April) 1941

- Medicine in World Crisis. C. A. Doan, Columbus.—p. 321.
 Congenital Defects of Femur: Report of Case. H. F. Van Epps and D. H. Downey, Dover.—p. 326.
 Use of Diuretics in Treatment of Certain Localized Edemas. M. A. Schnitzer, Toledo.—p. 328.
 Diagnosis of Early Pulmonary Tuberculosis. S. E. Wolpaw, Cleveland.—p. 338.
 Technique for Cholecystectomy. M. E. Blabd, Cleveland, and W. Mendelsohn, New Haven, Conn.—p. 343.
 Subacute Bacterial Endocarditis: Case Report. P. C. Colegrove, Oberlin.—p. 346.
 Carcinoma of Pituitary Body: Case Record Presenting Clinical Problems. C. D. Aring and R. H. Fuller, Cincinnati.—p. 350.

Physiological Reviews, Baltimore

21:217-382 (April) 1941

- Changing Concepts of Chemistry of Muscular Contraction. J. Sachs, Ann Arbor, Mich.—p. 217.
 Recent Developments in Histochemistry. I. Gersh, Baltimore.—p. 242.
 Intermediary Metabolites and Respiratory Catalysis. K. A. C. Elliott, Philadelphia.—p. 267.
 Effect of Anoxia on Alimentary Tract. E. J. Van Liere, Morgantown, W. Va.—p. 307.
 Cardiac Automaticity and Response to Blood Pressure Raising Agents During Inhalation Anesthesia. W. J. Meek, Madison, Wis.—p. 324.
 Physiology of Itching. S. Rothman, Chicago.—p. 357.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

16:1-80 (March) 1941

- *Eumydrine in Treatment of Hypertrophic Pyloric Stenosis: Analysis of Forty Consecutive Cases. Helen M. M. Mackay.—p. 1.
Observations on Gastric Acidity During the First Month of Life. R. A. Miller.—p. 22.
Comparison of Breast Feeding in Ten Classes of the Population. Margaret Robinson.—p. 31.
Laboratory Investigation of Pneumonia Among Infants and Children. W. J. Auger, with technical assistance of Isabel Scott.—p. 35.
*Prognosis and Treatment of Acute Diffuse Peritonitis in Children Since Advent of Chemotherapeutic Drugs. K. M. Alford.—p. 43.
Helium-Oxygen Inhalation: Recent Advance in Treatment of Laryngitis and Tracheitis. Genevieve Delfs.—p. 52.
Nephrolithiasis in Children. J. W. Jackson.—p. 55.
Hodgkin's Disease in Children. D. J. M. McCausland.—p. 59.
Icterus Gravis Neonatorum with Erythroblastosis. Helen McKinley.—p. 63.
Development of Vitamin K and Its Clinical Uses in Neonatal Period. H. Savage.—p. 67.

Atropine Methylnitrate for Pyloric Stenosis.—Mackay treated 40 infants with hypertrophic pyloric stenosis with atropine methylnitrate. Projectile vomiting began before the child was 26 days of age; the average at onset was 27 days (youngest 7 days, oldest 68 days). The onset was usually sudden. The average duration of projectile vomiting before treatment was started was fifteen days. Fourteen of the 40 babies had other complications or were extremely feeble on admission. The complications were hematemesis, abdominal distention, pulmonary collapse with infection, pyrexia, boils, symptoms usually attributed to alkalosis, prematurity, cyanotic attacks and convulsions. The babies came from a poor district in the East End of London and treatment at their homes presented difficulties. All but 2 were hospitalized. Atropine methylnitrate solution (1:10,000 in water) was given by mouth usually half an hour, sometimes twenty minutes, before each feeding. The first dose varied from 0.5 to 1 cc. (from 0.05 to 0.1 mg.). This was increased at each feeding by 0.5 cc. until 2 to 3 cc. six times a day was reached, the child receiving from 1.2 to 1.8 mg. of the drug in twenty-four hours. Further increases were made if vomiting was not checked. Of the 40, 5 died during treatment; a sixth died of enteritis and pneumonia, which developed at home four and a half weeks after vomiting had ceased. All vomiting, large or small, of the 31 infants cured with the drug, was said to have ceased within twenty-five days. Excepting for "very small vomits," vomiting was stopped in an average period of ten days. The gain in weight of the babies responding rapidly to treatment was good; for example, in the first week 14 babies gained between 8 and 17 ounces (from 240 to 510 Gm.). Complications other than those existing before treatment was begun developed in some children; diarrhea in 7 (4 of whom died), bronchitis in 4, otitis media in 1, nasal discharge in 1 and pneumonia in a child admitted with a collapsed lung. All these have recovered. Two had hematemesis before treatment was given, and in 2 others it developed in the hospital; 1 of the latter died. Edema developed in 2, in 1 as a result of chilling and in the other presumably from excessive fluid administration. Of the 14 babies suffering from some complication before treatment was started, 9 were cured by atropine methylnitrate, 1 by operation, and 4 died. The biggest cause of mortality in pyloric stenosis treated in the hospital is often infection acquired in the hospital. To this the present series is no exception; of the 5 babies who died, 4 had diarrhea. Sex evidently played no part in the prognosis. Very young babies appear to respond less readily to treatment; however, provided other conditions are favorable, young babies may respond well. It is difficult to say whether or not rapidity and severity of onset influenced the results of treatment. Only in the youngest babies was severity of spasm or vomiting a major factor in determining the outcome. The author feels that a continued high fluid intake often produces poor appetite and diminishes the effectiveness of the drug on the pylorus. Gastric lavage did not appear to have

much influence on prognosis. The primary cause of death of 3 of the 5 patients was an infective diarrhea acquired in the hospital, and in 2 a contributory cause was failure to reduce the atropine methylnitrate when abdominal distention was observed, leading in 1 to paralytic ileus. The average duration of treatment for the patients who recovered was fifty-six days. Because of the risks of hospitalization (cross infections) a cooperative mother, who is accurate and methodical, can carry out the treatment at home under supervision. She needs to be instructed in careful measuring and in symptoms of overdosage, and if her supply of breast milk is liberal it may be better, though probably not essential, to teach her to express her milk in order to give the baby at first a measured quantity.

Acute Diffuse Peritonitis and Chemotherapeutic Drugs.—By plotting all the deaths of children from acute diffuse peritonitis since 1935, Alford finds that the mortality rate has decreased appreciably during the last two years. The cases were divided into two groups: (1) primary or idiopathic peritonitis, 67 instances, and (2) secondary peritonitis, 103 cases. Since January 1939 patients have been given large doses of sulfanilamide or sulfapyridine, and peritonitis, whether primary or secondary, has responded to hospital care much more readily. The mortality in 1935 for primary peritonitis was 91.6 and for the secondary type 70 per cent. The respective percentages for the following years were 91.6 and 80 for 1936, 100 and 55 for 1937, 62.5 and 55 for 1938, 9 and 34.7 for 1939 and 0 and 7.6 for 1940. The present treatment for primary peritonitis in children at the Hospital for Sick Children is (1) to obtain peritoneal fluid on admission in order to determine the specific organism; (2) to check the examination of fluid by blood culture, sputum examination (Auger method) and vaginal culture; (3) to put the patient in Fowler's position; (4) light cradle to the abdomen; (5) administration of fluids intravenously (two-thirds dextrose in distilled water plus one-third physiologic solution of sodium chloride to infants and a 5 to 10 per cent solution of dextrose in physiologic solution of sodium chloride to older children); (6) to determine the child's type of blood and to have a donor ready to give transfusion if the hemoglobin or the erythrocytes drop following chemotherapy or if the serum protein falls following continuous intravenous fluid therapy; (7) to give sulfanilamide from 2 to 3 grains (0.13 to 0.2 Gm.) per pound of body weight in twenty-four hours until the concentration in the blood reached 10 mg. per hundred cubic centimeters, for streptococcal infections and then to decrease the dose to from 1 to 1½ grains (0.065 to 0.1 Gm.) per pound of body weight until the temperature remains normal for from two to three days and clinically the child is cured, and (8) to give in twenty-four hours from 1 to 2 grains (0.065 to 0.13 Gm.) of sulfapyridine per pound of body weight for pneumococcal infections; this is continued until the concentration in the blood reaches from 4 to 5 mg. per hundred cubic centimeters and then 1 grain per pound until the temperature remains normal for from two to three days and clinically the child is improved. In addition, from 100,000 to 200,000 units of type specific antipneumococcus rabbit serum is given. The best results obtained in the last year in secondary peritonitis followed combined surgical treatment with the use of the chemotherapeutic drugs. The secondary peritonitis in 79 instances was due to acute appendicitis with perforation. The best treatment for these cases is to diagnose and treat the acute appendicitis before rupture. Chemotherapy, although it will not take the place of any of the indicated surgical measures, has proved a valuable weapon in the armamentarium against appendical peritonitis, as well as a specific for primary streptococcal and pneumococcal peritonitis.

Medical Journal of Australia, Sydney

1:503-536 (April 26) 1941

- Workmen's Compensation for Persons Diseased Other Than by Conditions of Their Employment. J. B. Cleland.—p. 506.
Id. S. H. Skipper.—p. 511.
Institutional Experience with Pertussis Vaccine. E. S. Stuckey.—p. 513.
Agranulocytosis Following Use of Sulfapyridine: Report of Case Associated with Abdominal Symptoms. G. N. Morris.—p. 515.

Schweizerische medizinische Wochenschrift, Basel

71:105-124 (Feb. 1) 1941. Partial Index

- *Clinical Experiences with Transfusion of Conserved Blood. O. Schürch and H. Willenegger.—p. 105.
Significance of Weak Blood Characteristics in Determination of Blood Donors: Case. J. Morawiecki.—p. 110.
Ectomy of Sarcomatous Embolus in Statu Nascendi: Case. R. Meyer-Wildisen.—p. 111.
Administration of Vitamin B₁ by Dielectrolysis. P. Steiner.—p. 112.

Conserved Blood Transfusions.—Schürch and Willenegger base their clinical observations on 160 selected transfusions in which group O donor blood was exclusively used after it had been conserved with sodium citrate and dextrose. Transfusions were made in quantities of 300 cc. Most of the blood was less than two weeks old. About one third derived from the military source had been conserved three to four weeks previously. The older blood showed a hemolytic margin of 0.5 to 3 cc., whereas all blood under two weeks did not exceed 1 cc. The observations made included general condition, temperature, pulse, shock symptoms, blood pressure, blood picture, urinalysis and rechecks of agglutination titer and hemolysis. In the majority of cases an increase in hemoglobin, blood pressure and eosinophile leukocytes was seen. No fatalities occurred. Severe complications consisted in temporary shock and hemoglobinemia and were due to hemolysis and agglutination. These in turn were due to the use of blood of dissimilar blood groups and to the presence of already hemolyzed blood in the transfused blood. No complications are encountered if group O blood with high agglutination titer is transfused slowly and in small quantities. Cachexia constitutes a contraindication. Febrile reactions, amounting to 5 to 10 per cent, generally observed after conserved blood transfusion and representing a higher rate than is seen in fresh blood transfusions, may be due to broken down albumin. Morphologic and biologic investigations show that this disintegration is accelerated as conserved blood ages. The authors believe that conserved blood produces effects similar to those of fresh blood and is superior to saline solutions. Serious reactions can be avoided by careful conservation methods and by testing the blood for hemolysis by sedimentation before use. Elevation of temperature can be further controlled by employing only conserved blood whose age does not exceed two weeks. They recommend that the agglutination titer of group O conserved blood be indicated on the ampules.

Archiv für klinische Chirurgie, Berlin

198:481-674 (April 16) 1940

- *Endometriosis. U. Graff.—p. 481.
Histologic Investigations on Surgically Treated Fractures of Neck of Femur: Processes on Bone and Cartilage After Bone Necrosis. F. Felsenreich.—p. 532.
*Malignant Tumors of Thyroid. S. A. Choldin.—p. 579.
Diagnosis of Syphilitic Disorder of Liver and Stomach. A. Vogl.—p. 634.
Osmotic Dehydration in Posttraumatic Increase in Brain Pressure by Hypertonic Solutions with Admixture of Colloid. G. Jorns.—p. 639.
Pathology and Nature of Schlatter's Disease. S. Nagura.—p. 650.

Endometriosis.—According to Graff, symptoms of endometriosis are primarily genital. It is most frequent in women of the premenopausal age. Dysmenorrhea, backache, intermenstrual pain, metrorrhagia, menorrhagia and dyspareunia are frequent complaints. Sterility is comparatively frequent. Pathologic lesions of the genitalia, such as ovarian cysts, uterine myomas, displacements and signs of previous pelvic peritonitic inflammation complete the clinical picture. In the presence of obscure symptoms, diagnosis may be aided by the administration of large doses of progestin, for this will intensify symptoms caused by endometriosis. In the endometriosis of the rectocervical septum, vesical, rectal or vaginal symptoms may predominate. Rectal symptoms are probably the most frequent: there is pressure, or a foreign body sensation in the rectum, and bowel evacuation is more difficult. Increasing stenosis of the rectum dominates the clinical picture. Examination reveals hard masses between the uterus and the rectum, more rarely single hard nodules. The rectum itself may contain nodular masses which may create the impression of a tumor, cause hemorrhages and suggest carcinoma. Dense masses of tissue may fill the pelvis or may surround and compress the ureters. Changes in the intestinal and stenotic symptoms, the changing rectoscopic appearances, the fact that rectal mucosa remains

intact and that infiltration is chiefly in the rectocervical space together with scarcity of bleeding speak against carcinoma and for endometriosis. Rectal endometriosis may be combined with endometriosis of the colon, particularly of the sigmoid flexure. These cases are characterized by increasing constipation with attacks of ileus at the time of menstruation and colics and pain in the left hypogastric region. Diagnosis is difficult when the ileus is total and roentgen examination may fail completely. Simultaneous existence of chocolate cysts of the left ovary, myomas of the uterus and extensive adhesions in the culdesac of Douglas indicate endometriosis. The author discusses endometriosis of other segments of the colon, of the small intestine, of the inguinal region, of the umbilicus and in cicatrices. The genesis of endometriosis is not completely understood. Sampson's implantation theory has many adherents and seems well founded, except for the demonstration of the possibility of implantation of the cast off mucosa. The seroepithelial theory maintains that formation of endometriosis is traceable to cells of the coelomic epithelium. The author feels that even though this theory explains the majority of endometrioses it is based on a number of presumptions which have not been proved. Endometriosis of the intestine which does not cause symptoms may be left alone. Resection is recommended for endometriosis of the small intestine with symptoms of total or partial ileus. In colon endometriosis, ileus must first be treated. In the absence of ileus and in the presence of partial stenosis and a favorable general condition, resection of the involved intestine is advisable. Bowel resection with preservation of genital functions is capable of accomplishing a cure without the danger of a relapse. Resection is comparatively simple in stenosing endometriosis of the sigmoid flexure but difficult in endometriosis of the rectocervical space. Here it is rarely possible to remove the infiltrating masses without mutilating interventions on the genitalia and the rectum. It has been demonstrated, however, that incomplete removal of the masses may effect a cure, although there is danger of recurrence, if the ovarian function is preserved. Irradiation of the ovaries or of the endometriosis may effect a cure without complete disappearance of the induration, but irradiation may also increase the rectal stenosis. Resection of the rectum with primary suture has produced good results with a small surgical mortality.

Malignant Tumors of Thyroid.—Choldin reports observations on 142 thyroid tumors seen at the Oncologic Institute in Leningrad. Of these 59 were malignant. This is not an indication of the incidence of malignancy but rather of the nature of the institute, whose function is to treat malignant tumors. Reports from literature cited by the author indicate that malignant tumors of the thyroid amount to only 1 or 2 per cent or less of the total number of thyroid tumors. Women predominate in both types, but the predominance is much more pronounced for the benign type, in which the ratio is 6:1, whereas in the malignant type it is 2:1. Benign goiters of women develop chiefly at the time of the menarche and the menopause. Every hyperplasia of the thyroid may develop into a neoplasm. Adenoma of the thyroid may become malignant in the course of its development by direct transformation into a malignant tumor with changes in the biomorphologic nature or by transmission of its elements by way of the blood or lymph vessels, without visible change in the basic structure ("hemophilic metastasizing adenomas"). The growth of neoplasms of the thyroid is analogous to that of the mammary gland. Here too the developmental chain has at one end a functional hyperplasia, which for a while is reversible (mazoplasia) but which later is transformed into irreversible proliferations (fibroadenomatosis cystica); and at the other there are the true benign and malignant neoplasms. "Metastasizing" adenomas and metastases of thyroid tissue can be spoken of only in cases in which the adenomatous structure of the tumor and of the metastases is proved or in which by constant observation or at microscopic necropsy a thyroid tumor has been ruled out. Microscopic constancy of infiltration of epithelial elements into blood vessels in the "metastasizing adenomas" makes it possible to designate them as hemophilic "adenomas." Their structural similarity

to the benign and their potential capacity for the formation of distant metastases excludes them from the benign as well as from the malignant growths and identifies them as a transitional form. The papillary strumas develop slowly and offer best permanent results after treatment. Among the carcinomas, adenocarcinomas with preservation of the adenomatous structure show the least, while the diffuse forms show the greatest malignancy. The less differentiated the cellular elements, the more malignant is the course. Microscopic diagnosis calls for examination of different sections of the tumor. The clinical course of malignant strumas is characterized by three groups of symptoms: (1) those which accompany changes in the thyroid itself, in its size, consistency and mobility; (2) symptoms produced by impairment of the function of neighboring organs (respiration, swallowing and speech); (3) symptoms indicative of disturbances in the entire organism or of certain systems, (endocrine disturbances, metastases, cachexia). Metastases are frequent in the malignant tumors of the thyroid, 28 of the 59 patients exhibiting metastases at the time of admission to the institute. The papillary goiters cause metastases chiefly by way of the lymphatic system; the cancerous growths metastasize with equal frequency through the lymph and through the vascular systems. Malignant goiter is not hopeless. About 40 per cent of patients treated at the institute survived for more than three or five years, and more than a fourth were well at the end of these periods. The best permanent results are obtained with surgery or with surgery plus irradiation. The success of treatment is largely dependent on the stage of the disease. The earlier the treatment, the longer the survival. In men results were highly unfavorable, only 2 of 17 having survived, whereas of 34 women 16 survived, and of these 10 are well. The author thinks that this is due to the fact that in women malignant tumors are mostly of the type which pursues a more favorable course. The operative mortality is comparatively high and is generally due to postoperative hemorrhage, laryngeal edema and pneumonia. It is especially high when tracheotomy is performed.

Medizinische Welt, Berlin.

14:1241-1268 (Dec. 7) 1940. Partial Index

- *Intestinal Tuberculosis and Its Treatment. H. Alexander.—p. 1241.
Sinking and Protrusion of Female Genitalia. W. Schaeffer.—p. 1243.
Effects on Foot of Wearing Wooden Shoes. A. Basler.—p. 1246.
Simple Method of Avoiding Disadvantages of Delay in Boiling in Nylander Sugar Test. P. Dassau.—p. 1249.

Intestinal Tuberculosis.—Alexander maintains that, while primary intestinal tuberculosis is rare, secondary intestinal tuberculosis is one of the most frequent complications of pulmonary tuberculosis and its existence always implies a more serious prognosis. Early diagnosis is difficult because there is not a single symptom which definitely demonstrates its presence. The critical evaluation of the entire clinical picture is therefore the more important. Roentgenologic examination is of great help. The fully developed clinical picture is characterized by irregular hectic fever, poor appetite, progressive emaciation, unfavorable blood picture with severe deviation to the left, high sedimentation speed, and dyspepsia in which characteristic pains appear from one half to one hour after ingestion of food. The treatment of intestinal tuberculosis cannot be schematic. The diet especially must be adjusted to the individual case. Repeated examinations of the stools will indicate the degree of irritation and the admixture of mucus. The utilization of the different foodstuffs with the aid of Schmidt's test meal is helpful because it reveals abnormal processes of fermentation. If diarrhea predominates, a bland diet, like that employed in enterocolitis, is advisable. If there is considerable putrefaction, meat and eggs should be restricted; when fermentation is present, the carbohydrates must be limited. Roughage in the food should be avoided even if constipation is the outstanding symptom. Evacuation of the bowel must be effected by enemas, liquid petrolatum or the eating of cooked fruit before bedtime. If the diet is deficient in vitamins, medication with vitamins is necessary. Other medicaments cannot be entirely dispensed with, but they should be as mild as possible and given in the smallest effective doses. The author mentions animal charcoal, kaolin, tannin preparations, bismuth salts and calcium preparations. Opiates should not be resorted to as long as

possible, but as the intestinal tuberculosis progresses they will become necessary. Application of warmth is advisable. Tuberculin and irradiation offer little promise of success. Pneumoperitoneum often exerts a favorable effect, which however is only temporary. Isolated cecal tuberculosis is an entity per se because here surgical treatment or roentgen irradiation is effective. Since intestinal tuberculosis develops as a rule because infected sputum is being swallowed, patients with pulmonary tuberculosis must be taught the importance of careful expectoration. This and the suitable treatment of gastric and intestinal disturbances are important prophylactic factors.

Tokyo Igakkwai Zassi, Tokyo

55:109-188 (Feb.) 1941. Partial Index

- *Trachoma Studies with Special Reference to the Prowazek Bodies. Y. Mitui and K. Asida.—p. 183.

Prowazek Bodies in Trachoma.—Mitui and Asida report the results of examinations of 156 patients suffering from trachoma among the inhabitants of Sinojima, a small island in the Pacific. The population of the island is about 2,800 and the greater percentage of inhabitants are engaged in fishing. Four distinct stages are recognized: (1) acute trachoma characterized by fresh granular lesions, (2) early chronic trachoma with little evidence of scar formation, (3) intermediate chronic trachoma with a moderate amount of scar formation but no evidence of complications and (4) late chronic trachoma with pannus formation and distortion of the eyelashes in addition to definite presence of scar tissue. Eye smears were made from corneal scrapings and stained by the Giemsa technic. The positive cases were identified by the presence of Prowazek bodies, not free in the extracellular space but embedded in the phagocytic cells. These inclusion bodies were found in 88 out of 105 (83.8 per cent) cases of trachoma. The positive Prowazek bodies indicate the severity of the disease, being present alike in acute and chronic stages. The difficulty in demonstrating the inclusion bodies in chronic cases of trachoma does not constitute valid evidence for denying the etiologic role these bodies may play in the pathogenesis of the disease. A few statistical studies included in this investigation indicate the degree of likelihood of transmission of the disease during infancy and childhood and point out that the hygienic and sanitary conditions of the home, as well as of the persons in it, are definite factors in the control of the disease. In many instances evidence was obtained of spontaneous cure of the disease, and the rate of such cure appears to be in direct proportion to the duration of the disease.

Acta Chirurgica Scandinavica, Stockholm

84:283-382 (Feb. 8) 1941

- Regenerative Capacity of Epithelium of Tunica Interna After Vascular Suture. L. Efskind.—p. 283.
*Postoperative Complications with Thrombosis and Embolism: Their Frequency, Time of Appearance and Duration of Hospital Stay After Operation. S. Linde.—p. 310.
Pulmonary Embolism on the Operating Table: Three Cases. G. Pettersson.—p. 321.
Treatment of Tuberculous Cervical Lymphoma: Late Results in Two Hundred and Thirty Cases Treated Partly Surgically, Partly Roentgenologically. H. B. Wulff.—p. 343.
Isolated Dislocation of Ulnar Nerve with Report of One Case. E. Schildt.—p. 367.

Postoperative Thrombosis.—Linde calculated the incidence and mortality rate of postoperative thrombosis, including embolism, and the prolonged hospitalization necessitated by it, on the basis of case histories sifted out from the records of 11,400 operations performed in two Swedish hospitals during 1934-1939. Eighty-seven per cent of the patients presented an age level above 30 years. Thrombosis occurred in 259 cases, an average of 2.3 per cent. A higher census was observed for cholecystectomy (3.7 per cent), varicotomy (3.5 per cent), appendectomy with drainage (3.3 per cent, without drainage 1.8 per cent), mammary carcinectomy (2.7 per cent) and nephrectomy (2.7 per cent). There were 41 deaths from thrombosis (11.3 per cent) out of a total mortality of 362, representing a 15.8 per cent death rate for blood clot involvements. Thrombosis set in, on the average, on the tenth day after surgical intervention. Prolonged hospitalization due to thrombosis or embolism amounted to thirty-eight days. The symptoms accompanying thrombosis formation are listed by the author. The study throws light on the therapeutic value of heparin in postoperative cases.

Book Notices

Air Raid Precautions. In Ten Parts. Reprinted by Permission of the Controller of His Britannic Majesty's Stationery Office. First American edition. Cloth. Price, \$3. Various pagination, with illustrations. Brooklyn: Chemical Publishing Company, Inc., 1941.

This is the first American edition of this work, published in England. It consists of ten parts, describing the work of rescue parties, decontamination services, air raid wardens' service, structural defense, report of air raid damage, notes on training and exercise, gas detection, protection of windows, repair of respirators, and the care and custody of equipment. It is an official document issued by persons who have had the responsibility of caring for the population under air raid conditions. In the preparation of our own nation for civilian defense, this book will be invaluable.

Thirty-Fifth Annual Report, 1939-40, The Carnegie Foundation for the Advancement of Teaching. Paper. Pp. 170. New York, [n. d.].

"Society demands that the school shall be in its image."—*Anatole de Monzie*. With this quotation President Jessup opens the first chapter of his report. After a few observations respecting the educational ends and means revealed over the past decade or more in statements by nationals of Germany, France and Britain, he proceeds to examine a few phases of the American educational program in the light shed by the programs of these other nations. Despite the economic pressure of recent years, "reports indicate . . . that there are in the United States . . . more than 1,300,000 college students." Evidently, says President Jessup, "with the sanction of equality of opportunity which these figures imply, many colleges have accepted students who were incompetent, have given scholarships they could not afford to give, have made loans that they could not collect. The unfortunate results of such policies are so obvious, however, that we may expect that they will be discontinued."

Attention is called to the fact that many colleges are already wondering about the possible danger perhaps inherent in the common American practice of working one's way through college and to President Conant's vigorous action to secure funds "to enable students of capacity to be freed from the necessity of spending long hours in menial work that cannot help but have serious consequences upon their physical health and that may well seriously affect their personalities." Another section deals with the adjustment of the foundation's resources so as to meet its obligation for teachers' retiring allowances. For the successful solution of this difficult problem, the foundation and the Carnegie Corporation deserve high praise. Fittingly, a tribute is paid to the memory and the services of the late President Pritchett, the creator, and for so many years the director, of the foundation.

Part II of the report is designated "Educational Enquiry" and deals largely with a project initiated a few years ago concerned with the construction, maintenance and use of a set of examinations for the purpose of sampling a student's organized knowledge in various fields with a view to determining his fitness for admission to graduate school. As originally constructed, the examination included seven tests to be completed by the student in six hours—two half-day sessions. The fields covered were (1) mathematics, (2) physical sciences, (3) biologic sciences, (4) social studies, (5) literature and the fine arts, (6) a foreign language and (7) verbal factor. All students took the same tests, and the scores of each were recorded on a chart based on the average scores of a standard group of men, recently graduated from college, who were taking graduate work for the first time. Likewise the average scores in each test of students majoring in each important field were so indicated on the chart that each student could compare his own score with those of others in the same group. Primarily, therefore, the examination operates in the interest of the student, especially of the student who is consciously in the business of educating himself. He can neither pass nor fail, but by its means he can learn where his greatest available knowledge lies, how it compares with that of his potential competitors, where his resources are weak or lacking, and at what points they might well be extended. This should of course closely con-

cern any institution that is interested in confirming intellectual growth, in ensuring a student's fitness for his studies and in estimating his consequent dividend in effective education. Another chapter deals with "learning and forgetting."

Part III deals with the administration of the foundation, including the customary report on gifts and allowances.

The fourth section consists of brief biographic notes concerning those members of the teaching profession under the retirement provisions of the foundation who have died during the preceding year. Included in this volume is also the report of the treasurer.

The Etiology of Child Behavior Difficulties, Juvenile Delinquency and Adult Criminality with Special Reference to Their Occurrence in Twins. By Aaron J. Rosanoff, M.D., Leva M. Handy, M.A., and Isabel Rosanoff Plesslet, B.A. State of California Department of Institutions Psychiatric Monographs No. 1. Published for the Department of Institutions. Paper. Price, \$1. Pp. 187. Sacramento: California State Printing Office, George H. Moore, State Printer, 1941.

In this monograph the authors have attempted a study of the etiology of behavior disorders and adult criminality in twins. They collected the records of 409 pairs of twins. In this series there was some mental or behavior difficulty of one or both of the twins in each pair. The material for study was obtained from child guidance clinics, school clinics, neurologic clinics and special classes for problem children in the public schools. The cases of juvenile delinquency, i. e. delinquent boys or girls under 18 years of age, were collected from juvenile courts, especially those that were placed on probation or committed to correctional institutions. Persons 18 years of age or over who were convicted and sentenced by a criminal court to a city or county jail or to a state or federal prison or were granted probation constitute the remainder of the material.

In order that the cause of any physical or mental disorder may be properly classified, it is important that the twins be correctly diagnosed as to type—whether they are monozygotic, identical or one egg twins or dizygotic, fraternal or two egg twins. In a tabulated study of the material the authors note that among the monozygotic or identical twins, as would be expected, behavior disorders, delinquency and criminality seemed relatively more common in males than in females—and, as might be anticipated, the two individuals tended to react uniformly as to criminal tendencies. Twins of the same sex, though dizygotic in origin, show less concordance in criminality or behavior disorders. The same was found true of twins of opposite sex, though even among these a certain proportion of mental abnormality occurred in both of the twins. These differences between the one egg and the two egg twins may be readily explained by the fact that any twin of dizygotic origin may be said to have the same characteristics as any other sibling in the same family. Newman believes that dizygotic twinning is not twinning at all.

The text of this volume considers detailed case histories of male and female monozygotic twins, male dizygotic twins, female dizygotic twins and twins of opposite sex. Ever since the days of Sir Francis Galton, attempts have been made to ascertain whether the mentality of twins was due to nature or to nurture. The present authors believe that, while hereditary factors may play a part in the etiology of behavior disorders, these factors alone are not sufficient to explain the mental difficulties. They would support this view by referring to their results, which show that 13.1 per cent of the monozygotic twins gave discordant manifestations. Furthermore, they believe that hereditary factors are discounted by the fact of the high incidence of concordance among the fraternal or dizygotic twins, as compared with the corresponding results among singly born siblings. In short, the authors are not convinced from their case studies that heredity is the preponderating cause of mental deviations in twins. On the other hand, detailed analysis of their material leads the authors to think that cerebral birth trauma is a factor of the highest importance in the etiology of child behavior difficulties, juvenile delinquency and adult criminality. In this connection they state their belief that hereditary factors which may play a part in the etiology of antisocial behavior produce their effect by determining an undue vulnerability of the brain tissues, thus greatly increasing the hazard of cerebral birth trauma. The authors point out an interesting

observation, namely that delinquency and criminality are more frequent in the male offspring. This was best brought out by a consideration of the twins of opposite sex, particularly in a study of adult criminality, with 154.5 per cent of relative excess of males affected.

Johannes Lange, who made investigations and published a monograph on the same subject, was led to believe from his studies that heredity seemed to be an important etiologic factor. He cited cases in which identical twins, even when living in distant localities and under different environments, tended to resort to similar crimes about the same period of life. Lange also found that in dizygotic twins one or both might present symptoms of criminality and delinquency, though it should be pointed out that criminality among siblings occurs in many families, generation after generation. Lange believed, as a result of his studies, that environmental influences may produce delinquency and criminality. He thought that periods of poverty and financial distress tend to increase crimes against property. He also pointed out that attacks of encephalitis in infancy or early childhood may cause disorders of behavior or even criminality.

There are some other factors to be considered in the etiology of mental disturbances of one kind or another in twins. They are likely to be feeble and premature at birth, and as a result they may suffer from spontaneous cerebral hemorrhages. Or they may suffer from difficulties in delivery, leading to cerebral trauma. In some instances, one is led to believe that disturbances of nutrition or blood supply to the fetus may lead to physical or mental maldevelopment. Frequently one observes in dizygotic twins that one is born robust, and the other is small and weak and hardly viable; perhaps the latter twin occupied an unfavorable position in the uterus and suffered from a deficient blood supply.

The etiology of child behavior difficulties, juvenile delinquency and adult criminality among twins does not permit of ready or easy solution. Twin births are not of extremely rare occurrence, about one in one hundred. Many are and remain normal, physically and mentally, and a comparatively small proportion show mental defects. It would seem that in order to make a more complete appraisal of the cause of mental aberrations in twins, information should be collected concerning the health and nutrition of the mother during pregnancy, and a detailed record of the labor, as well as careful clinical observations of the feeding and health of the babies during the first days and years of life. The facts are that, even after one reads this excellent monograph, the conclusion that cerebral trauma should be considered the principal cause of behavior disorders, delinquency and criminality in twins lacks convincing proof.

A Textbook of Dietetics. By L. S. P. Davidson, B.A., M.D., F.R.C.P., Professor of Medicine and Clinical Medicine in the University of Edinburgh, Edinburgh, and Ian A. Anderson, M.B., Ch.B., Clinical Tutor and Assistant in the Metabolic Wards, the Royal Infirmary, Aberdeen. With Diet Sheets Constructed by Miss Mary E. Thomson, S.R.N., Sister Dietitian to the Royal Infirmary. And a foreword by Sir John Boyd Orr, M.D., D.Sc., LL.D., Director, Rowett Institute for Research in Animal Nutrition, Aberdeen. Cloth. Price, \$4.25. Pp. 324. New York: Paul B. Hoeber, Inc., 1941.

In Great Britain as in the United States, nutrition is to the fore. Few physicians endeavor to keep abreast with the mass of dietetics, yet diet has come to occupy so intimate a place in both the causation and treatment of various disorders that the modern physician must realize that a sound knowledge of nutrition is fundamental to a high quality of medical care. Much of the illness which afflicts human populations is directly attributable to dietary deficiencies. Moreover, the general resistance to all types of disease is also influenced by such factors. In this volume the authors have analyzed the general dietary considerations and then present the present status of knowledge in Great Britain on special factors related to specific diseases. In a considerable number of tables and in a large appendix they provide recommendations for the use of the diet in special diseases and also many facts of general importance. The volume is, of course, written in British English; and, while it compares favorably with a number of American textbooks, there are others which are far superior.

Modifikatsiya operatsii Razumovskogo na yaichke: eksperimentalnoe issledovanie. [By] G. I. Pinchuk. S. predislavlen l pod redaktsiei B. Z. Gutnikova. [Modification of Razumovskiy Operation on Testicles; Experimental Study.] Paper. Price, 3 rubles; 50 kopecks. Pp. 62, with 25 illustrations. Rostov on Don: Rostovskoe Oblastnoe Kulgozdatel'stvo, 1939.

This monograph, in Russian, presents experimental work on dogs and horses in which the epididymis was resected and the vas deferens was implanted into the rete halleri of the testis. The author concludes that ligation of the vas deferens, when followed by obliteration of the vas, leads in some instances to atrophy of the testis. Resection of the epididymis and ligation of the vas lead to dystrophy and atrophy of the testis. The author modified Razumovskiy's operation of anastomosis between the vas and the testis by fenestrating that part of the vas which is implanted into the bed of the testis with the view of creating temporary drainage. Preservation of the deferential artery is essential for success. By creating a temporary fistula of the vas, the author was able to ascertain the patency of the transplanted duct. This brief monograph should prove of interest to urologists, particularly because of an interesting review of the literature on the subject.

Where Angels Dared to Tread. By V. F. Calverton. Cloth. Price, \$3. Pp. 381. Indianapolis & New York: Bobbs-Merrill Company, 1941.

In the United States have developed most of the peculiar mind healing, utopian and peculiar cults known to the world. In the United States, because of our particular organizational ability, many of these cults have achieved their greatest development. V. F. Calverton made a careful study of some of the most notable ones, including the Rappites, Oneida County, Zion City and Father Divine. The index provides the names of innumerable others which are casually mentioned, but the dozen or more which were carefully studied are typical of all. In an epilogue Calverton points out that these communities had the advanced conception of a cooperative society but were ancient in their religious perspectives. Most of these colonies have peculiar rules of belief, peculiar rules of diet, peculiar rules in regard to sex. Thus they concentrated on the chief interests of mankind and thus they achieved their followers. Calverton concludes that man can achieve a cooperative commonwealth in our industrial society but he cannot do it in terms of an agrarian or theocratic utopia.

Textbook of Medicine. By Various Authors. Edited by J. J. Conynbare, M.C., D.M., F.R.C.P., Physician to Guy's Hospital, London. Fifth edition. Cloth. Price, \$7.50. Pp. 1131, with 55 illustrations. Baltimore: William Wood & Company, 1940.

Five editions of this well known British textbook of medicine have appeared in eleven years. This edition has eighteen contributors, many of them well known in this country. The book suffers in places from excessive brevity and illustrates in others the rapid advance in medicine which makes it almost impossible for a textbook to be strictly up to date. Thus sulfanilamide is listed as one of the treatments for pneumococcal pneumonia; doubtless it is rarely used in Britain or this country any more for that purpose. There is a section on psychologic medicine and another on common diseases of the skin. Possibly it is necessary to include such sections in a textbook on medicine, but it might be more desirable to omit them and give more complete discussions of other diseases. In spite of the war, this book will doubtless continue to hold its high place in the regard of medical students and many practitioners.

Food, Teeth and Larceny. By Charles A. Levinson, D.M.D. Cloth. Price, \$3. Pp. 232. New York: Greenberg, Publisher, 1940.

This is a relatively voluminous discussion of a special variety of the fake accident racket, namely injury to the teeth and mouth from foreign bodies in food, in which dentists as well as physicians may be involved, innocently or otherwise. It includes descriptions of numerous typical alleged accidents, of adequate and unsatisfactory professional examinations and of court proceedings in cases that came to trial, concluding with recommendations for the management and handling of such accidents, both real and alleged. It will serve as a useful reference work for all concerned with this type of accident, whether physician, dentist, lawyer, food handler or layman.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

OLD POLIOMYELITIS AND BASAL METABOLISM

To the Editor:—I am interested in obtaining some information on the interpretation of basal metabolic tests, in particular of a white man who complained of lassitude, coldness and a feeling of inadequacy, especially physical. The physical examination showed hypotension, subnormal temperature, bradycardia and other signs which might readily be interpreted as the result of hypothyroidism, vagotonia or a lowered tonus from previous spinal cord injury. The most significant fact in the history and examination was an attack of acute anterior poliomyelitis in his youth, involving many muscle groups and resulting in crippling and the necessity of wearing several heavy braces. If the present fatigability is due to the carrying of these heavy braces, why has this man had plenty of energy and felt well for the thirty or forty years between his acute paralysis and the present? A basal metabolic test was made with a ± 3 result. The weight of the braces was obtained by the patient before leaving for the test and was subtracted from his total weight in obtaining the proper figure for the calculation incidental to the basal metabolic test. Clinically the patient showed a remarkable improvement following the administration of even small doses of strychnine, belladonna and thyroid. The rationale of the treatment was to reduce the vagotonia (belladonna), increase the metabolic rate (thyroid) and increase the activity of the spinal cord tonus (strychnine). I am especially interested in obtaining the following information: 1. Does acute anterior poliomyelitis affect not only the anterior horn cells of the gray matter of the spinal cord but also the cells involved in maintaining tonus, e. g. blood pressure? 2. Is the autonomic nervous system affected? 3. In a case in which there is atrophy of many muscle groups, what special considerations are there in obtaining and interpreting a basal metabolic test? 4. Ordinarily basal metabolic tests are compared with standards obtained through many thousands of examinations of supposedly normal persons. In what way would the old infantile paralysis victim be different from these so-called normal persons?

Braham H. Golden, M.D., New York.

ANSWER.—1. There is no evidence that acute anterior poliomyelitis affects permanently any other than the anterior horn cells of the spinal cord. In the acute stage it is well recognized that the whole of the spinal cord is involved in the infectious process, including the meninges.

2. During the acute stage the autonomic nervous system is affected, but after the initial stage of the disease the permanent defects are only in the anterior horn cells.

3. In obtaining and interpreting basal metabolic tests no special considerations are necessary with patients who have marked muscular atrophy.

4. Patients with old poliomyelitis would not be considered different from normal persons as far as basal metabolism goes, provided due care was used in making the test.

OVERHEATING AND SUNSTROKE

To the Editor:—What is the specific pathologic difference between "overheating" and "sunstroke"? Are they simply gradations of the same process? Does the actinic ray enter into the picture at all? If so, how?

M.D., California.

ANSWER.—"Overheating" and "sunstroke" both are the result of heat retention in the body. When the environmental temperature reaches or exceeds body temperature, body heat cannot be lost by radiation. If the environmental air is saturated with moisture, body heat cannot be lost by evaporation and the body temperature begins to rise. This heat retention often results in symptoms of dizziness, ataxia, dyspnea and weakness. It may go on to peripheral vascular collapse and syncope. This is known as "overheating" or heat exhaustion. It is often complicated by loss of chloride due to excessive sweating. In this condition the cerebral heat regulating mechanism is undisturbed but heat loss is impossible because of environment. The body temperature rises but a few degrees. Indeed, the mouth temperature may be subnormal because of the peripheral vascular collapse.

"Sunstroke" is the term applied to the heat retention due to a loss of heat control. The skin is hot and dry as in high fever and the body temperature rises to from 106 to 110 F. The heat regulating mechanism does not readily respond and the temperature may remain high for several days. "Sunstroke" may come on primarily or it may be a further development of "overheating."

Thus, "overheating" is due to physical obstacles, to heat loss from the body while "sunstroke" is due to a disturbance of

heat regulation. Both are associated with heat retention. It is not likely that the actinic ray is involved in the picture because "sunstroke" or hyperpyrexia may result from exposure to high temperature and dry environmental conditions where there is no exposure to the sun at all. The prognosis in "overheating" is good, while in "sunstroke" the prognosis is much more grave.

SULFANILYLGUANIDINE

To the Editor:—Some difficulty has been experienced here in obtaining detailed information concerning the drug sulfanilylguanidine. I should be grateful for any information.

M.D., Hong Kong, China.

ANSWER.—Sulfanilylguanidine (sulfaguanidine) is the guanidine analogue of sulfapyridine and sulfathiazole. This drug is fairly water soluble, is poorly absorbed from the intestinal tract and is experimentally active against various bacteria. These properties allow the attainment of a high concentration of drug in the intestine with a low concentration in the blood and body tissues—a situation somewhat analogous to the use of sulfonamide drugs as urinary antiseptics. Determinations of the concentrations of sulfanilylguanidine in the blood and in the stools show that in patients saturation of the intestinal contents with the drug can be obtained with a dosage schedule which gives a low concentration of the drug in the blood, thus confirming deductions made from experimental observations on animals. Information available to date indicates that this drug is effective in the treatment of acute bacillary dysentery and possibly also in chronic cases. In other intestinal infections, sufficient data are not available to assess its value. The drug is being tried out as a prophylactic in operations on the colon.

The dosage schedule recommended is as follows: 0.1 Gm. per kilogram orally as an initial dose and then 0.05 Gm. per kilogram orally every four hours, day and night, until the number of stools drop to five or less daily; then 0.05 Gm. per kilogram every eight hours for at least seventy-two hours.

Few toxic effects have been observed in the treatment of patients with sulfanilylguanidine. These have been of the same nature as those observed with other sulfonamide drugs.

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PROBABLE NEUROCIRCULATORY ASTHENIA

To the Editor:—A game warden aged 37 gives a history of attacks of palpitation, nervousness, sweating, pallor and inability to talk in the presence of strangers or when he has to talk before an audience or testify before a jury in the line of his work. Lately the attacks have become more severe, with a moderate amount of pain in the heart on anginal nature. It has become bad enough now so that he hesitates to make an arrest or attend a convention or testify at a trial. He has had two or three attacks of pain in the abdomen, which have had some features of appendicitis; but the blood count was not high enough to merit surgical intervention. These attacks had no relation to the other attacks, which were brought on by excitement. Physically his examination shows few positive manifestations. His pulse rate was a little rapid on the first examination, but even the examination almost brought on an attack. The sedimentation rate, white blood cell count, hemoglobin, Wassermann test, blood pressure and temperature were all within normal limits. My impression was that he was suffering from a functional heart or so-called soldier's heart, but my problem is how to treat the condition. Will he have to change his work, and, if so, what work would you recommend?

M.D., California.

ANSWER.—From the facts given this appears to be an example of "the irritable heart of soldiers," better called "neurocirculatory asthenia." If angina pectoris due to coronary artery disease can be excluded—an electrocardiogram and roentgen examination would be helpful for this purpose—the case should be regarded as one of anxiety neurosis. Any latent source of infection should be sought for and, if found, should be removed.

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There is no known specific treatment. The functional nature of the condition should be promptly explained to the patient. Temporarily he should be relieved of undue responsibility. He may be encouraged to engage in moderate physical exercise such as fishing, golf, bicycling and ping pong, but not to the point of exhaustion. Psychotherapy is useful in the hands of a trained person who will give him sufficient time. Drugs, other than sedatives for poor sleep or laxatives for constipation, are without permanent value. Amphetamine sulfate is useful for the symptoms of depression and fatigue but should be avoided in coronary artery disease; its administration should be confined to the morning and early afternoon hours to avoid insomnia. For the present a vacation from work may be advisable. If a change of work is absolutely necessary, routine occupation with little responsibility and no unusual strain is indicated. If possible it is advisable to avoid a definite resignation of his present work as game warden, as this might involve him in new difficulties. The duration of such conditions is difficult to estimate.

PSORIASIS

To the Editor:—A woman aged 31 has had psoriasis since she was about 6 years of age. From the age of 13 until about two years ago a strong ultraviolet ray treatment, given once a week, would control the condition fairly well. Within the past two years, and especially within the past ten months, the condition has become definitely worse. With the past portions of her face, the psoriasis is covering her entire body. On several occasions the patches are now coalescing, and in places which did not previously itch the itching has become intense. This patient is high strung, and to give her any rest whatever at night she must have 3 to 9 grains (0.2 to 0.6 Gm.) of sodium amytal, and on rare occasions ½ grain (0.03 Gm.) of morphine has been needed to obtain any effect. About a year ago the patient was placed in a local institution and the following treatment instituted: At night the entire body was covered with crude coal tar, and this was left on all night. In the morning a bath and then a rub with liquid petrolatum were given, followed by one to two hours of close, intense ultraviolet irradiation. After about two weeks of treatment, the entire body was clear. There was no sign of psoriasis present. The patient was discharged and went back again to one to two hours of ultraviolet treatment a week. Within two months the lesions reappeared as before. Several months later she was again placed in an institution, and the same regimen was followed with the exception that the liquid petrolatum was replaced by bismuth compounds and the bismuth compounds were better but had not cleared up as much as the first time. Incidentally, about a year ago this patient weighed 186 pounds (84.4 Kg.). She was advised to reduce, and the psoriasis improved up to a certain point—that is until the patient reached 140 pounds (63.5 Kg.). However, she insisted on reducing further, against advice, down to 114 pounds (51.7 Kg.). As she has reduced from 140 to 114 pounds, her psoriasis has definitely become much worse. She realized her error and tried to regain some of her weight. She now weighs 124 pounds (56 Kg.). Recently I read of the use of injections of a bismuth compound without any noticeable results. Is there any new therapy known for the treatment of this condition? Would you suggest readmission to the institution? The patient could be 2 inches away from the source of the ultraviolet rays, take an hour's treatment and not show any effect of a burn. I myself, using the same lamp, held my arm under it for two minutes at the same distance and received an intense erythema. I am beginning to wonder whether or not the ultraviolet rays, which previously helped the patient, are not now having just the opposite effect on the psoriasis.

M.D., New York.

ANSWER.—Severe itching in psoriasis vulgaris is not a common sign. It does, however, occur in acute psoriasis or in psoriasis irritated by local applications or exposures to intense ultraviolet rays. Pruritus is almost always more acute in a "neurotic" person, and the statement that the patient is "high strung" makes this last premise an important one to consider. Ormsby (Diseases of the Skin, Philadelphia, Lea & Febiger, 1934, p. 264) cited Poltebnoff (in Unna, P. G.: *Dermatologische Studien*, Leipzig, Leopold Voss, 1891, vol. 12, p. 347) as being a strong supporter of the nervous origin of psoriasis. "He believes that psoriasis is one of the multiple symptoms of a vasomotor neurosis in which the disturbances in the circulation occur just as they do in various organs of the body, sometimes extending to the skin." The neuropathic hypothesis has had many supporters (Weyl and others, including Besnier, Poltebnoff, Bourdillon (Arch. f. Dermat. u. Syph. 38:405, 1897)). After the external causes of irritation that might contribute to the acuity of the eruption and cause severe itching have been ruled out, the possibility that sodium amytal, which has been receiving in large doses for some time, is causing a toxic erythema which is masked by the psoriasis and which could well cause severe itching must be considered. The ability of the barbitol compounds to produce exfoliative dermatitis (Sexton, D. L.; Pike, G. M., and Nielson, A.: *Exfoliative Dermatitis and Death Due to Phenobarbital*, *The Journal*, Feb. 22, 1941, p. 700) must be considered, and a threatened exfoliative dermatitis in any case of acute

psoriasis is always possible. A complete examination of the blood should be done to determine whether any abnormality in leukocytes exists that may presage a lymphoblastoma. (See footnote, page 16 in special article on psoriasis by Fred Wise and M. B. Sulzberger, *Year Book of Dermatology and Syphilology*, Chicago, Year Book Publishers, Inc., 1940.) Psoriasis is a capricious disease showing remissions and exacerbations, and Pernet has stated that those cases showing remissions in the summer frequently show a great improvement after exposure to ultraviolet rays. The treatment with crude coal tar (Goeckerman, W. H., and O'Leary, P. A.: *Erythroderma Psoriaticum: Review of Twenty-Two Cases*, *The Journal*, Dec. 17, 1932, p. 2102) is effective in many cases of psoriasis and, like all treatment, must be persisted in when recurrences take place. In this treatment "the patient is anointed with a 2 per cent ointment of crude coal tar before retiring at night. In the morning the ointment is removed with olive oil, leaving a thin film on the affected areas, and the body is then exposed to gradually increasing doses of ultraviolet light. In the interval between treatment a bland ointment, such as boric acid salve or petrolatum, should be applied. Caution must be used to avoid excessive exposure to ultraviolet, especially during the first weeks of treatment." Entrance into an institution or hospitalization in psoriasis is a matter of choice, depending on the patient's ability mentally and physically to carry out treatment as outlined by the physician in charge. The comment that "she is advised to reduce and the psoriasis was better" is interesting in the light of the work of Grütz, who, as a result of investigation on lipid metabolism in psoriasis, found excessive amounts of cholesterol and phosphatides and expressed the belief that psoriasis was caused by a disturbance of the metabolism of fats and obtained good results with diets low in fats or a fat free regimen. Madden (Treatment of Psoriasis, *The Journal*, Aug. 24, 1940, p. 588) expressed the belief that the low fat diet is of value in most cases of psoriasis. When the patient was reducing, she no doubt limited the ingestion of fats among other things in her diet, and it is probable that for this reason her psoriasis improved during this period. The value of therapy with bismuth compounds in true psoriasis is questionable. The newest therapy reported in true psoriasis is the use of lipocaine (Stewart, C. D.; Clark, D. E.; Dragstedt, L. R., and Becker, S. W.: *J. Invest. Dermat.* 2:219 [Aug.] 1939), which produces a reduction of blood lipids and "lends support to the idea that the psoriasis is associated with a deranged fat metabolism." Lipocaine, however, is not yet available for general use. Psoriasis is variable in its response to treatment, and its exact genesis is unknown. Like many conditions in medicine, cutaneous or visceral, rest in bed and freedom from the ordinary conflicts of life have a beneficial influence as an adjunct in any scheme of therapy, and as stated previously the matter of readmission of a patient to an institution is a question of fine judgment on the part of the attending physician, who knows all the facts and response surrounding the patient. Variations in a person's texture and pigmentation of the skin, since there exists an inherent difference of reaction to sunlight in different persons. It is conceivable that a type of treatment such as ultraviolet irradiation which is helpful at first reaches a status quo without further beneficial response on the part of the patient.

STREPTOCOCCI IN STOOLS

To the Editor:—I shall appreciate your opinion concerning the following questions: Can *Streptococcus viridans* or a haemolytic bc found by culture from the stools of normal persons? If so, in what percentage of individuals? If either strain of streptococcus can be recovered from a stool, how often is it of pathologic significance? Is there any evidence of therapeutic value of a vaccine made from either strain of streptococcus which is recovered by culture of a stool?

M.D., District of Columbia.

ANSWER.—*Streptococcus viridans* is commonly found in stools. The origin of these organisms in the stools may be the throat, where they are present in abundance. *Streptococcus haemolyticus* in the stools may also represent organisms in the nasopharynx. Hare and Maxted (*The Classification of Hemolytic Streptococci from the Stools* (The Classification of Hemolytic Cases of Scarlet Fever by Means of Precipitin and Biochemical Tests, *J. Path. & Bact.* 51:513 [Nov.] 1935) examined a series of 50 stools in consecutive cases of scarlet fever and found potentially infective strains in the feces of about 20 per cent of cases in which there was a hemolytic streptococcus infection of the nasopharynx. They examined 109 stools from normal parturient women in the first stage of delivery and found 29 to contain streptococci giving beta hemolysis on blood

agar. Human pathogenic group A strains were not encountered in this group as was the case in the stools from the patients with scarlet fever. There is no convincing evidence of the therapeutic use of a vaccine made from stool cultures of either *Streptococcus viridans* or *Streptococcus haemolyticus*.

OBESITY AND THYROID ADMINISTRATION

To the Editor:—A married woman aged 36, after a hysterectomy with bilateral salpingo-oophorectomy eleven years ago, gradually increased in weight from 135 pounds (61 Kg.) to 290 pounds (131 Kg.). To reduce she tried dieting, injections of estrogenic substance, injections of anterior pituitary and amphetamine sulfate by mouth—all to no avail. Four grains (0.25 Gm.) of thyroid daily started three and one-half months ago, brought her weight down 20 pounds (9 Kg.), but this had to be discontinued because of the development of a sensation of pressure under the right sternoclavicular articulation followed in a week or two by the appearance of a frequent hacking cough and slight difficulty in breathing. The basal metabolic rate was 0, and the pulse rate, which has always been between 85 and 95, showed no change. The blood pressure averages 165 systolic and 110 diastolic. The patient is now receiving injections of a preparation containing adrenal cortex extract, pituitary, ovary and thyroid but is gradually gaining weight. She insists that thyroid medication be resumed. Do you agree that her cough was probably caused by a substernal enlargement of the thyroid gland? How often does this occur during a course of thyroid therapy? Is there any possibility of continuing thyroid medication? Would the use of iodine be of any help? What else might be tried to reduce her weight?

M.D., Massachusetts.

ANSWER.—There is no evidence whatever presented in this communication for the presence of a substernal goiter. It would be impossible to say what the cause of the patient's cough is without more information. One would be particularly interested in knowing something about the condition of the patient's heart. Thyroid medication might be continued if the patient was carefully followed and the dose carefully regulated, but there are, of course, some patients who cannot tolerate thyroid in even small doses.

There are three ways of reducing: (1) by dieting, (2) by exercise and (3) by drugs. The best and most important method is dieting. The other two are only supplementary. The administration of a preparation containing adrenal cortex extract, pituitary, ovary and thyroid represents shotgun therapy. The only active ingredient of such a preparation is the thyroid which it contains.

The use of iodine does not seem indicated.

A patient like this should be placed on a well balanced diet of about 1,500 calories, supplemented, if possible, by a dose of about 2 grains (0.12 Gm.) of U. S. P. thyroid daily and by the administration of enough estrogenic material to control any menopausal symptoms from which she may be suffering.

TESTICULAR ATROPHY AFTER HERNIOTOMY— HERNIOTOMY AND GONORRHEA

To the Editor:—We operated on a man aged 31 in November 1939 for a recurrent inguinal hernia. This hernia had been originally operated on in 1930 elsewhere. The patient's general condition before operation was good. He gave a history of having had gonorrhea several times. At the time of operation there was a considerable amount of scar tissue about the cord. The spermatic cord was found to be small. There was a small hernial mass extending through the internal ring. This hernial sac was tightly adherent to the cord. This was dissected from the cord with great difficulty, and the canal was then reconstructed by transplanting all the fascia beneath the cord. His convalescence was a bit stormy in that on the second postoperative day he had an elevation of temperature and a swelling of the right part of the scrotum with pain and tenderness of the right testis. The operative wound was not infected. The diagnosis at that time was right epididymitis, vasitis and orchitis. This gradually decreased in severity. The patient was discharged from the hospital in two weeks' time. He was kept under observation for a period of six weeks and then was allowed to return to work. When he was last seen, in February 1940, there was atrophy of the right testis, but the patient complained of no pain and there was no recurrence of the hernia. I would like comment on the frequency of testicular atrophy following operation for hernia, the relationship of the reactivation of gonorrhea following operation for inguinal hernia and the relationship and effect of gonorrhea on sterility and potency. I would appreciate any comments and bibliography regarding these points.

M.D., California.

ANSWER.—The explanation of the sequelae in this case rests almost with certainty on the difficulty of the dissection of the cord from the sac. As the spermatic cord was small it is not unlikely that it was somewhat damaged in the first operation and that, as a result of the first operation, dense adhesions formed to the second sac. The dissection of this cord from the sac was a difficult matter and no doubt impoverished the vascular supply, which was already poor to start with. The post-operative swelling of the right testis, the pain and even the elevation of temperature would fit with a stasis of blood or thrombosis. Heuer and Andrus (Nelson New Loose-Leaf Sur-

gery, New York, Thomas Nelson & Sons, 1937, vol. 4, p. 638) say: "A primary swelling of the testis, epididymo-orchitis, was followed by atrophy of the testis in 5 to 10 per cent of instances." No figures are at hand as to the instances of atrophy of the testis after operations for inguinal hernia, but Claverley (*Lancet* 1:277, 1917) has written a paper entitled the Association of Atrophy of the Testicle and Inguinal Hernia. This paper was cited by Watson (*Hernia*, ed. 2, St. Louis, C. V. Mosby Company, 1938, p. 206). It pointed out that traumatism to the cord is sometimes followed by thrombosis, which is the usual cause of orchitis and epididymitis when they follow operations for hernia. It is almost impossible that the gonorrhea was reactivated by the operation for hernia. Young and Davis (*Practice of Urology*, Philadelphia, W. B. Saunders Company, 1926, vol. 1, p. 214) said "Acute epididymitis, both gonococcal and that due to other organisms, is rarely accompanied by pronounced orchitis." Young added that "acute orchitis is comparatively rare except in those cases associated with mumps."

Potency should in no way be affected by gonorrhea. Hinman (*Urology*, Philadelphia, W. B. Saunders Company, 1935, p. 832) said that "sterility may be due to strictures involving the vas deferens and to prostatoseminal vesiculitis as well as to other causes." Sterility and impairment of potency would be extremely unlikely in a case of this kind.

CONSTANT BLOOD SUGAR BEFORE AND AFTER DEXTROSE ADMINISTRATION

To the Editor:—I recently performed a series of ten blood sugar tests on a patient with diabetes. I performed a test during fasting, with dextrose, following intake of carbohydrate, and hourly tests throughout the day. The blood sugar invariably was 100 mg., and there were various percentages of sugar in the urine. A check of my apparatus showed the chemicals to be in good condition. What do you think of these results?

M.D., New York.

ANSWER.—Did all the specimens of urine contain sugar? If they did and the blood sugar analyses are accurate, then the patient has renal glycosuria and not diabetes mellitus.

It is suggested that the blood sugar technic be tested by doing your own blood sugar and that of a person known to have diabetes both fasting and at one hour after a meal.

DO RADIO TECHNICIANS HAVE MORE GIRL CHILDREN?

To the Editor:—May the use of high frequency current have some effect on sex determination where the fathers have been continuously exposed by working around such currents? This particular question was asked me recently by one of my patients, and I replied in the negative. My patient then informed me that a survey of certain New York radio stations showed that there was a great predominance of girl babies in the families of technicians at these stations. I am incredulous of this whole matter but would appreciate an opinion.

M.D., Virginia.

ANSWER.—As far as is known there are no statistical data on this point. It is difficult to conceive how high frequency currents can affect the male gonads in such a way as to destroy or inhibit the capabilities of the potential female-producing spermatogonia and them only. One wonders whether the persons who conducted the survey in radio stations made certain to limit their study to a consideration of the children born to the technicians after they began their work in the radio stations. Likewise it is important to know whether a large enough number of men were studied to make the survey statistically reliable.

KERATITIS AND MALARIA

To the Editor:—In *The Journal of May 10, 1941*, there is a question concerning morio as a cause of an inflammation of the eye. It is probable that the patient in question had a dendritic corneal ulcer, now known to be caused by a herpetic virus but formerly thought to be due to malaria. Duane in his translation of Fuchs stated that "dendritic keratitis was first described by Kipp, who pointed out that in America at least it is caused in nine cases out of ten by malaria. In Europe it is said to have the same cause as herpes febrilis. Fuchs said that 'cases like those occurring in America which are due to malaria are relieved by quinine.' Since that time practically all textbooks of ophthalmology except the most recent ones have given malaria as a cause of dendritic keratitis. Atkinson (*External Diseases of the Eye*, 1934) gave malarial keratitis as a secondary diagnosis for dendritic keratitis and cited Duane. Foster Moore, in Berens' "The Eye and Its Diseases" stated that dendritic ulcers are usually a sequel of a febrile attack and seem to be especially common in malaria. Duke Elder stated that perforation of the cornea is extremely rare and mentioned a report of a case by Lebin in 1933 which coincided with a case of malaria. Duke Elder listed the condition under the heading of herpetic keratitis. Probably the confusion arose from the prevalence of malaria, a chronic febrile disease, and vitamin deficient diets in the Southern states, both of which would tend to make the population susceptible to invasion by a herpetic virus.

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EXAMINATION OF THE HEART FOR MILITARY SERVICE

CHAIRMAN'S ADDRESS

FRED M. SMITH, M.D.
IOWA CITY

The determination of the fitness of the heart for military service presents problems that are seldom encountered in civil practice. Thus it is frequently necessary for the examiner to rely on signs alone, and these may be of questionable significance. Tachycardia, systolic murmurs and slight elevation in the blood pressure are commonly observed. Certain persons with tachycardia give poor response to exercise. This may have resulted from sedentary life or from chronic infection, or perhaps the history may disclose that it has been present since childhood.

Acceleration of the cardiac rate is often the first and maybe the only feature that attracts the attention of the examining physician. This is usually due to excitement incident to the examination and thus promptly subsides as the subject becomes relaxed. If, however, it persists, a careful search for a cause is demanded. Tachycardia may be caused by various conditions but is more commonly due to infection or irritable heart.

The response of the cardiac rate to a given amount of exercise does not necessarily provide information concerning the efficiency of the heart, nor does it determine the presence or absence of disease. It is of value, however, in estimating the general physical fitness. If the rate becomes excessive and the time required for it to return to the original level exceeds two minutes, the response is not satisfactory. This is often due to poor physical condition from various causes and not to the heart alone. Thus the response of persons with chronic valvular heart disease may be good, whereas that of one who has led a sedentary life or has an infection may be poor. In questionable cases the history with reference to the participation in physical activities and the response provides much better means of estimating the possibilities of the individual, provided he is free from disease. If it is found that he has been capable of withstanding strenuous exercise in the past, there is good possibility that he may qualify for military service.

The work of the cardiovascular boards during the first World War was chiefly concerned with the examination of men presenting varying degrees of irritable heart, commonly designated as neurocirculatory asthenia, or effort syndrome. The reduced tolerance to exercise is the most characteristic feature of this disorder. Thus on slight or moderate exercise the subject experiences shortness of breath, palpitation of the heart and fatigue

comparable to that normally produced by the more strenuous and sustained form of physical effort. Others in addition may have various other symptoms, such as precordial distress, giddiness or perhaps headache. All have unstable vasomotor systems, perspire freely and present cyanosis of the hands when the latter are in the dependent position. Some give a history of having had reduced tolerance to exercise since childhood. In another group the condition was associated with various chronic infections, particularly pulmonary tuberculosis, or followed severe acute infection, such as influenzal pneumonia. Finally in a number the disorder developed while engaged in active warfare. In this connection the series of cases studied by Lewis¹ are of particular interest. Lewis found that the majority of his patients were recruited from sedentary or light occupations. Moreover, the history disclosed that a large percentage of this group had the disorder in civil life and that many of these had been forced to adopt sedentary occupations. It is apparent from the results of this analysis that it is commonly possible to discover or suspect this condition before the subject is inducted into military service.

Alterations in the character of the heart sounds are seldom of much help in the diagnosis of heart disease. Accentuation of the first sound at the apex may be a prominent feature in mitral stenosis. However, it is generally associated with presystolic murmur. In the early stages of mitral stenosis the murmur is frequently confined to a small area and may not be elicited except immediately following exercise, particularly with the subject in the recumbent position and turned toward the left side. Intensification of the second pulmonary sound is present in mitral stenosis, and a loud aortic second sound results from hypertension. Alteration in the character of the latter, especially tympanic quality, is occasionally the first feature to suggest syphilitic aortitis and the possibility of a diastolic murmur. This murmur may escape detection unless a careful search is made. It is more easily heard by direct auscultation when the subject is in the sitting posture and while he is holding his breath after complete exhalation.

Systolic murmurs over the apex and the pulmonary area are common in men of the draft age, especially in those with tachycardia and slight elevation in the blood pressure. These murmurs are usually soft blowing in character, seldom transmitted to any significant extent, and frequently are altered by posture and respiration. Those of the cardiopulmonary variety are loudest at the end of inspiration and may entirely disappear at the end of forced expiration. There are many instances in which a final decision is dependent on additional information. This is especially true if the murmur is rather prominent and is constantly heard when the subject is in the standing and recumbent positions. A harsh mur-

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1. Lewis, Thomas: *The Soldier's Heart and the Effort Syndrome*, New York, Paul B. Hoeber, 1920.

mur at the apex is invariably indicative of structural alterations in the mitral valve and it is generally possible to demonstrate a presystolic murmur. In many instances, however, the history is negative for rheumatic fever. Levine² has emphasized the importance of grading murmurs with reference to their intensity and states that those of grade 2 intensity and above are generally due to organic disease. He further points out that a systolic murmur has greater significance if the heart rate is slow, the blood pressure is low and there is no anemia. It is, of course, well to bear in mind that a faint systolic murmur at the apex may be on an organic basis; consequently the correct evaluation of this sign is of great importance. The history of rheumatic fever, a diastolic murmur or increase in the size of the heart settles the issue.

A harsh murmur with the greatest intensity over the pulmonic area in the third and fourth left interspace, particularly when accompanied by a thrill, is generally due to one or more congenital anomalies. Further confirmation is obtained by the size and shape of the heart and by the electrocardiogram, if there is a conspicuous right axis deviation. The history is usually negative for rheumatic fever but may disclose that a murmur has been present since infancy.

The size of the heart is often the deciding factor in determining the presence or absence of heart disease. Ordinarily it is possible to locate, with a fair degree of accuracy, the left border of the heart by percussion.³ This is best accomplished with the subject in the sitting position and by direct percussion. If there is doubt regarding the results, they may be checked by the location of the apex impulse. In the normal subject the apex impulse is limited to a relatively small area and usually located in the fifth interspace, well within the nipple line. The outermost point at which the examining finger is raised by the heart represents the left border at this level and generally checks with the results obtained by percussion. The location of the apex beat varies with the type of chest. Thus in those with short thick chests it is at a high level and may extend to the nipple line. In general, however, if the apex impulse extends beyond this point it is indicative of cardiac enlargement. An unduly prominent apex beat or one occupying a relatively large area is ordinarily associated with enlargement of the heart. In persons with a thin chest and a hyperactive heart the impulse may be rather diffuse. This, however, disappears with the recession of the cardiac rate.

Frequently the blood pressure is slightly elevated with tachycardia but usually returns to the normal with the disappearance of the latter. If under these circumstances and after repeated determinations the systolic pressure is 150 or more and diastolic is 90 or more mm. of mercury it is indicative of hypertension. Further investigation may demonstrate the presence of albumin and casts in the urine or, in rare instances, coarctation of the aorta. In the vast majority of cases no cause is found and the condition is listed as essential hypertension.

Special laboratory procedures, such as the use of the roentgen ray and the electrocardiogram, are seldom necessary in this type of examination. Occasionally a roentgenogram is advisable to check the size and shape of the heart. In rare instances it may be difficult to dif-

ferentiate between premature beats and auricular fibrillation by auscultation, and thus an electrocardiogram is indicated. Auricular fibrillation, however, is generally associated with obvious structural changes in the heart. Sinus tachycardia may suggest paroxysmal tachycardia or perhaps auricular flutter. The fact that the cardiac rate in the former subsides with relaxation dispels any doubt about the situation. Finally the taking of an electrocardiogram may be justified, if the heart rate is unusually slow, in order to rule out the possibility of auriculoventricular block.

SUMMARY

The determination of the fitness of the cardiovascular system for military service may be difficult because it is frequently necessary for the examiner to rely on signs alone and often these are of questionable significance. Tachycardia, systolic murmurs, slight elevation in blood pressure or a combination of these are the features that usually attract the attention of the examining physician. These are commonly of no importance, but they demand careful investigation. Thus tachycardia may lead to the disclosure of infection, particularly pulmonary tuberculosis. Moreover, in certain of the remaining, the response to exercise may be poor and further study may reveal the presence of an effort syndrome. Systolic murmurs should always be carefully evaluated. The history may give important, or even decisive, information. Finally, a decision regarding slight elevation of the blood pressure is not justified until the cardiac rate has receded to the normal level.

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THE PROGNOSIS OF AURICULAR FIBRILLATION OF UNDETER- MINED ORIGIN

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AND

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From time to time, patients are encountered who display auricular fibrillation, either permanent or intermittent, as the sole evidence of disturbance of the heart. The frequent association of auricular fibrillation with obviously serious heart disease leads many physicians to consider this arrhythmia with gravity at all times and under all circumstances. Orgain and his co-workers¹ in 1936 called attention to the favorable prognosis associated with cases of uncomplicated or idiopathic auricular fibrillation. It is not our intention to cover the literature in this paper, for this was adequately done by Brill² in 1937.

Realizing the importance of acquiring further data on this subject in order to permit the segregation of the significant from the nonsignificant cases of auricular fibrillation, we have reinvestigated this subject with special reference to the clinical course of patients who exhibit auricular fibrillation in the absence of demonstrable evidence of organic heart disease and in the absence of any known etiologic factor.

From the Section of Cardiology, Mayo Clinic.

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2. Levine, S. A.: The Systolic Murmur: Its Clinical Significance. *J. A. M. A.* 101:436 (Aug. 5) 1933.

3. Mainland, Donald, and Stewart, Chester B.: The Comparison of Percussion and Radiography in Locating the Heart and Superior Mediastinal Vessels. *Am. Heart J.* 15: 515 (May) 1938.

MATERIAL

Seventy patients observed on one or more occasions from 1920 to the time of this report (March 1941) comprised the basis for this study. The presence of auricular fibrillation, permanent or intermittently recurrent, was the primary basis of selection. From the resulting large group of records, those in which the following symptoms or signs were present were deleted: (1) cardiac enlargement or abnormalities of the cardiac silhouette as revealed by the roentgenogram, (2) cardiac murmurs, (3) hypertension, (4) hyperthyroidism, (5) electrocardiographic abnormalities such as significant changes in the T wave, disturbances in auriculoventricular or ventricular conduction and right axis deviation, and (6) observations obviously denoting heart disease. Patients more than 55 years of age were not included. Thus, patients included in this study showed auricular fibrillation as the sole evidence directing attention to the heart.

DISTRIBUTION ACCORDING TO AGE AND SEX

At the time at which the diagnosis of auricular fibrillation was made, the youngest patient was 26 years of age, the oldest was 55 and the average age for the group was 46.6 years. The distribution of the age of the patients by decades is shown in the table.

There was a decided preponderance of males over females, the ratio being 4:1. In the series reported by White and his co-workers an even larger preponderance of males occurred; the ratio was 7:1. The reasons for the discrepancy in incidence by sex are not clear.

FOLLOW-UP OF PATIENTS AFTER DIAGNOSIS

Of the 70 cases in the series reviewed we were able to obtain information regarding the present status of health in 59 either by means of recent examination or by correspondence. In what follows we shall refer only to these 59 patients.

Six patients were dead at the conclusion of this study; 5 of them died from causes entirely unrelated to the heart. The causes of death were, respectively, pneumonia, psoas abscess, carcinoma of the stomach, mushroom poisoning and noncardiac complications occurring after surgical repair of a large recurrent ventral hernia. Only 1 patient (1.7 per cent) died as the result of heart disease. This patient was a man for whom the diagnosis had been made when he was 55 years old and who died nine years later at the age of 64 years. This one death from heart disease among 59 traced patients is no more, and perhaps it is even less, than is to be expected in an average group of persons at the ages of the observed patients, considering the period of observation covered.

Fifty-three of the 59 patients who were traced were alive at the conclusion of this study. No significant differences were observed between the patients who had permanent auricular fibrillation (of which there were 30) and those who had intermittent auricular fibrillation (of which there were 29); therefore, all those alive at the end of the study will be considered in one category. Thirty-eight of the 53 patients (71 per cent) who were living reported their health as good and were able to engage in their accustomed occupations without difficulty. Eleven (21 per cent) of the 53 patients alive at the end of this study showed conditions entirely unrelated to the cardiovascular system, and 4 (8 per cent) were obliged to live under some restrictions: one because of the occurrence of slight edema when normal activities are pursued; another is known to be covered

by disability insurance and in the case of the other 2 the cause of the disability is not definitely stated.

The full significance of these data is not appreciated until the time intervals of the study are considered. Twenty-three (43 per cent) of the 53 patients were alive from one to five years after their first examination at the Mayo Clinic, 13 (25 per cent) were alive from six to ten years after examination, 12 (23 per cent) were alive from eleven to fifteen years after examination, 3 (6 per cent) were alive from sixteen to twenty years after examination and 2 (4 per cent) were alive twenty years after examination.

The data were further analyzed with the assistance of the Division of Biometry and Medical Statistics of the Mayo Clinic. In the table are shown the ages of the patients at the time of diagnosis, and also the ages as of the time of last report. In this table it is seen that at the time of diagnosis the average age was 46.6 years and that, considering only the 59 patients who were traced in the follow-up study, the average age at the time of last report was 53.7 years. Therefore it is seen that the 59 patients in the traced group were observed for an average period of seven years. During this period there were six deaths, a mortality rate in

Age at Diagnosis and at Last Report of Seventy Patients Who Had Auricular Fibrillation of Undetermined Origin

Age, Years	Number of Patients at Stated Age			
	At Time of Diagnosis	At Time of Last Report		
		Living	Dead	No Follow-Up
20-29.....	2	..	..	1
30-39.....	12	2	..	2
40-49.....	27	12	1	4
50-59.....	29	30	3	4
60+.....	..	9	2	..
Total	70	53	6	11
Mean.....	46.6	53.7		
Youngest.....	26			
Oldest.....	55			

this seven year period of about 10 per cent. For an average group of persons of age 47 years, according to United States Life Tables,³ there is to be expected a mortality rate of about 9 per cent in the ensuing seven years, so that the number of deaths which had occurred in the group of patients suffering from auricular fibrillation was about what would be expected in a general group composed of persons of the same age observed for about the same length of time as our patients. It is certainly reasonable to suppose that, if these patients who had otherwise unexplained auricular fibrillation were subject to some form of latent cardiopathy at the time of the original examination, the adverse effects of this disease would become manifest in the period ensuing after discovery of the cardiac arrhythmia which was considered in this study.

IMPORTANCE OF TREATMENT IN THIS GROUP OF PATIENTS

It is of much interest to note that 35 of the 53 patients who were alive at the completion of the survey were not following any specific therapeutic regimen. Five of the remainder were taking quinidine in various amounts very irregularly, 6 were taking digitalis "off and on," and 7 gave but vague details of the treatment which they were receiving. The state of health of these

3. United States Life Tables. Department of Commerce, Bureau of the Census, 1930.

patients, then, obviously was not dependent on any rigid program of treatment. Experience has shown that, of all patients subject to auricular fibrillation, those under discussion are perhaps the most amenable to quinidine therapy, for in them a normal sinus rhythm can usually be established without much difficulty. Yet treatment with quinidine does not seem to be a life-saving measure for these patients and may be expected at the most to afford subjective comfort to a patient who is otherwise unduly conscious of his cardiac irregularity.

Paradoxically, the use of quinidine ("a potent drug, for good and for evil" as MacKenzie spoke of it) meets its greatest contraindications when it might be expected to do the most good; namely, among patients in whom an ectopic rhythm complicates an already seriously damaged heart.

CONCLUSIONS

The results of this study clearly indicate the benignity of auricular fibrillation occurring under the specified definition of this investigation and again emphasize the necessity for not venturing prognostic conclusions on the basis of the presence of this arrhythmia alone; rather, such conclusions should be based on the status of the heart as determined by the presence or absence of disease and on the functional capacity of the heart itself.

TREATMENT OF THE POSTENCEPHALITIC PARKINSONIAN SYNDROME

WITH DESICCATED WHITE WINE EXTRACT OF
U. S. P. BELLADONNA ROOT

HOWARD D. FABING, M.D.

AND

MEYER A. ZELIGS, M.D.

CINCINNATI

Since the introduction of the "Bulgarian treatment" of postencephalitic parkinsonism by Raeff in 1926, numerous European and American investigators have confirmed the efficacy of this therapy in comparison with older methods of treatment.¹ Attempts have also been made to determine what factors in the treatment are responsible for the clinical improvement commonly noted in patients receiving the "Bulgarian treatment."

The basis of this treatment is the root of the belladonna plant. It has been held by some investigators² that the root of the belladonna plant indigenous to Bulgaria is therapeutically superior to roots grown elsewhere, but other investigators have denied this. Van Lehoczy³ found no difference between Bulgarian and Hungarian varieties. Alcock and Carmichael,⁴

Hill⁵ and Neuwahl⁶ found the English root as efficacious as the Bulgarian, and Vollmer⁷ found that extracts of the Bulgarian and the U. S. P. roots could be interchanged in a given case without affecting the results. Panegrossi⁸ used Italian roots, Baldauf,⁹ German, Kauders and Oesterreicher,¹⁰ Austrian and Coste and Devèze,¹¹ French, with results equal to those of the Bulgarian. Analysis of roots from various parts of the world tends to substantiate the clinical observation that the therapy is not dependent on the geographic source of the root. The alkaloidal content of the root does not differ qualitatively from region to region, although the gross appearance and total alkaloidal yield are variable.¹²

The method of extraction of the root, however, seems to be of great importance. Raeff, instead of employing dilute alcohol as an extractive and thereby obtaining an orthodox tincture, made a decoction of the macerated root using white wine as a menstruum. Pharmacologic studies by Neuwahl⁶ and Fabing¹³ have shown that there is a difference in the action of the hydroalcoholic extract (tincture) of belladonna root and the white wine extract. Fabing prepared decoctions of the root in identical fashion but used 12 per cent ethyl alcohol in one instance as an extractive and white wine in the other. Although the total alkaloidal yield was similar in the two products (0.02 per cent), the following differences in action were noted:

1. When 5 drops of the alcoholic extract was instilled in a cat's eye, intense mydriasis occurred. When the white wine extract was similarly employed, mydriasis did not result.

2. Subcutaneous injection of the two preparations in dogs led to different effects. Fifteen cc. of wine of commercial belladonna root was injected subcutaneously in a dog weighing 19 pounds (8.6 Kg.). The animal became drowsy and quiet and a bit depressed. The drug did not show any effect on respiration or on body temperature. There was some mydriasis about one hour after the injection. Fifteen cc. of a decoction prepared from the same commercial belladonna root and 12 per cent alcohol was injected subcutaneously in a dog weighing 20 pounds (9 Kg.). Shortly after injection the dog appeared uneasy and drowsy and showed signs of severe ataxia; there was enhanced panting, and the animal kept howling and barking; there was intense mydriasis. The animal remained in its excited and apparently delirious state for more than twelve hours and showed a recovery to normal in the next twenty-four hours.

Thus pharmacologic differences in the mydriatic effect in the cat's eye and the toxic effects on sub-

From the Department of Internal Medicine, Neurologic Division, University of Cincinnati College of Medicine.

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cutaneous injection in dogs seem to point to a qualitative rather than to a quantitative difference of alkaloidal yield when the same belladonna root is extracted with 12 per cent alcohol and with white wine.

A synthetic product¹⁴ has been developed in this country to approximate the alkaloids found in white wine extract of belladonna root, and clinical reports concerning its use have been favorable.¹⁵ Neal and Dillenberg,¹⁶ however, found that this preparation yielded clinical improvement which was similar in nature but not as well defined as that obtained with a "natural" white wine decoction of Bulgarian belladonna root.

METHODS AND MATERIALS

The drug employed in the treatment of the patients with parkinsonism was a white wine extract of U. S. P. belladonna root. One pound (454 Gm.) of ground U. S. P. belladonna root was mixed with five pints (2,365 cc.) of dry white wine and allowed to stand overnight at room temperature. After the extraction, the filtrate was concentrated under reduced pressure until the product was reduced from its liquid state to a pilular consistency. The product was then chemically assayed and adjusted so that each 100 Gm. contained 0.75 Gm. of the total alkaloids of belladonna root. The extract was made into a granulation by mixing with an inert material and drying at a temperature not exceeding 140 F. (60 C.). The granulated mass was assayed chemically, and further inert material was added so that each tablet made from it would contain 0.4 mg. of the total alkaloids. The granulated mass was compressed into tablets, which were given a light sugar coating.¹⁷

CLINICAL MATERIAL

The patients included in this study were selected from office practice and from the wards of the Hamilton County Chronic Disease Hospital. The period of observation extended throughout the year 1940 and in many cases through 1939. There was a total of 64 patients, of whom 13 were in institutions and the remainder were studied in private practice. These patients exhibited all grades of severity of the parkinsonian syndrome. The duration of symptoms varied from two to fifteen years.

The method of administering the drug was to begin with small doses, usually 1 tablet at bedtime. The dose was then raised slowly to the level of each individual patient's tolerance. The level of tolerance varied widely, from 3 to 50 tablets a day. The average optimal dose was found to be 7 to 10 tablets daily. A too rapid rise in the dose was avoided, and a month or more was usually employed in determining the final optimal dose. Some patients were found to do best when taking but two doses daily (at bedtime and twelve hours later in the morning), whereas others best tolerated three doses daily at intervals of eight hours, and still others seemed to profit most by dividing their total dose into four or five portions given throughout the day. The optimal dose was defined as that dose which brought the greatest clinical relief with the least toxic side reactions. Since the margin between the most effective therapeutic dose and the toxic dose was always a small

one, it was necessary to observe these patients carefully during the trial period while the optimal dose was being determined. The number of tablets necessary to bring about relief of symptoms usually varied in accordance with the severity of the parkinsonism; larger doses had to be employed in the cases of more severe parkinsonism.

TOXIC EFFECTS

Toxic effects were common and were essentially the same as those found in poisoning with any drug of the atropine series. The earliest toxic effects were moderate mydriasis, difficulty in accommodation and dryness of the upper respiratory passages. Increase in the dose caused increase in these symptoms, plus flushing, redness and hotness of the skin, slight tachycardia and suppression of sweating. Cerebral symptoms beginning with dizziness and some clouding of the sensorium and then even progressing to hallucinosis and confusion may occur if the dose is increased indiscriminately. Therefore any symptoms beyond mild mydriasis and dryness of the mouth should be met by dropping the dose slightly and maintaining it at the lowered level until a new level of tolerance has developed. The root of the sweet iris, or calamus root, has been advocated to

Degree of Improvement in Severe and Moderate Parkinsonism

Previous Condition	Improvement										Total
	Maximal ++++		Moderate +++		Slight ++		Minimal +		None 0		
	No.	%	No.	%	No.	%	No.	%	No.	%	
Moderately severe.....	18	54.5	15	45.5	0	0.0	0	0.0	0	0.0	33
Very severe..	8	25.8	10	32.2	8	25.8	3	9.7	2	6.5	31
Total.....	26	40.6	25	39.0	8	12.5	3	4.7	2	3.2	64

counteract the oral dryness which almost universally accompanies use of the drug, but most patients have found calamus root so bitter that they have preferred the dryness to such a taste. Hard lemon-flavored candy drops have proved useful in combating dryness of the mouth. Instillation of 1 to 2 drops of 1 per cent pilocarpine hydrochloride solution into each eye has proved effective in relieving mydriasis and disturbances of ocular accommodation, especially in those patients who read a great deal.

The management of patients with parkinsonism is far easier in an institution than it is in office practice. In the latter instance the patients are seen at infrequent intervals and occasionally a mild toxic state develops which is upsetting to the patient and his household. A mild sedative effect is common with this medication, and these patients tend to sleep at slightly longer intervals at night, and many of them like to take a nap in the afternoon, although they had not been accustomed to do so formerly.

No dietary restrictions seemed necessary, but all patients reported that alcoholic drinks cannot be tolerated with the drug. Patients frequently reported acute gastric upsets after a single whisky highball or after a single cocktail. It is generally true, although not universally so, that patients who can tolerate large quantities of belladonna are those who have tolerated other drugs of the atropine series in large quantities. Patients who begin using this drug come to depend on it and are faithful in taking their medication. It has been

14. "Rabellon," a product of Sharp & Dohme, Philadelphia.
15. Gayle, R. F., Jr.: Treatment of Parkinsonism with a Preparation of Belladonna Root, Virginia M. Monthly 66:707-710 (Dec.) 1939. Vollmer.
16. Neal, Josephine B., and Dillenberg, S. M.: A Comparison of Belladonna and Other Forms of Medication in the Treatment of Chronic Encephalitis, New York State J. Med. 40:1300-1302 (Sept. 1) 1940.
17. "Vinobell," a product of the William S. Merrell Company, Cincinnati.

reported that after some months the drug can be discontinued and the gains made will be maintained. This, most emphatically, has not been our experience.

CLINICAL RESULTS

The results were impressive and approximated those found by other workers with belladonna therapy. The symptoms most improved were those of rigidity, salivation and postural disturbances, such as posteropulsions and anteropulsions. Relaxation of muscular rigidity and a general subjective feeling of well-being usually heralded the beginning of improvement. The rigidity was more beneficially affected than the tremor, the latter being less frequently improved unless it was accompanied by some degree of muscular stiffness. Oculogyric crises were relieved entirely in 3 cases and improved in 2 cases.

"Cure" is a term which implies a healing of the underlying lesion, and this is not to be expected. The evaluation of improvement in a therapeutic investigation in which no quantitative laboratory methods are available is more than difficult, for it is totally dependent on the arbitrary appraisal of the observer. In order to describe more accurately the degree of improvement noted in these patients, we have set up the following criteria for various levels of improvement:

1. "Minimal" (+) = subjective improvement and some lessening of nursing care.
2. "Slight" (++) = definite improvement in ability to get around and feed self; nursing care no longer necessary.
3. "Moderate" (+++) = the foregoing plus objective improvement in rigidity and/or tremor, postural disturbances, gait, speech and facies plus partial economic and social rehabilitation.
4. "Maximal" (++++) = the foregoing plus a complete or almost complete clinical abatement of parkinsonian symptoms plus complete or almost complete economic and social rehabilitation.

The patients were divided on the basis of the degree of neurologic involvement into groups with moderately severe and very severe parkinsonism. The results, grouped in accordance with the foregoing standards, were tabulated as is shown in the accompanying table.

COMPARISON OF THERAPEUTIC EFFECT OF BULGARIAN AND U. S. P. EXTRACTS

Of the total 64 patients, 46 were treated with a similarly prepared liquid white wine decoction of belladonna root gathered in Bulgaria and obtained through Paul Hopfe of Hamburg, Germany, who guaranteed its source, before they were treated with the desiccated U. S. P. tablet. In no case were we able to determine any difference in therapeutic effect, and the two methods of therapy have been interchanged without alteration of results. Since the liquid preparation was found to be chemically unstable after a short period of time, it was replaced by the desiccated tablet.

SELECTION OF PATIENTS

It is impossible to state which patients will respond best to the treatment, but it is generally true that those under 40 years of age, those whose symptoms have been present but a few years, those with considerable rigidity and little tremor and those who can tolerate large quantities of the drug will do best. Those with involvement on one side only usually do well also. However, the variability in response is so great that one is justified in attempting therapy with the drug even when these ideal conditions are not present.

The drug is effective in the cases of postencephalitic parkinsonism as well as in a large group of cases in which no clear history of acute encephalitis is available but in which involvement is almost certainly of postencephalitic origin. However, patients with the so-called degenerative type of the disease who have associated cerebral arteriosclerosis and generalized vascular disease and who are usually above 60 years of age are unable to tolerate large enough quantities of the drug to receive benefit at all comparable to that in the postencephalitic group. Some few of these patients, however, are helped, and the drug deserves to be tried in cases of degenerative parkinsonism. It must be borne in mind that toxic symptoms occur quickly in these persons with arteriosclerosis, and one must be prepared to abandon the drug if untoward effects occur with small doses.

SUMMARY

Since the introduction of the "Bulgarian belladonna treatment" of postencephalitic parkinsonism by Raefl in 1926, many investigators have confirmed the efficacy of this therapy. Study of the factors in the treatment which are responsible for the clinical improvement so often seen in cases of this type of parkinsonism reveals that there is no peculiar efficacy in the belladonna root grown in Bulgaria but that the apparently better results are due to the manner of extracting the alkaloids of the root. White wine extracts seem to yield products qualitatively different from those obtained by hydro-alcoholic extraction (tinctures). This statement is confirmed by pharmacologic study. A preparation of a white wine extract of U. S. P. belladonna root which was then desiccated and pressed into tablets containing a total alkaloidal content of 0.4 mg. each was used.

Of a total of 33 patients with moderately severe parkinsonism 54.5 per cent showed a maximal improvement and 45.5 per cent showed a moderate improvement. Of a total of 31 with very severe parkinsonism 25.8 per cent showed a maximal improvement, 32.2 per cent showed a moderate improvement, 25.8 per cent showed a slight improvement, 9.7 per cent showed a minimal improvement and 6.5 per cent showed no improvement.

The desiccated tablet made from U. S. P. belladonna root was found to be as efficacious therapeutically as was a white wine decoction of the Bulgarian belladonna root. The dose was found to vary widely. Toxic reactions were frequent, and the dose had to be varied to prevent the occurrence of these reactions. In cases of arteriosclerotic parkinsonism, the drug was found to be too toxic for general use.

It is felt that preparations of the type described are superior to drugs of the belladonna series heretofore employed in the treatment of postencephalitic parkinsonism.

Oxygen.—Joseph Priestley (1733-1804), a nonconformist English clergyman, is usually credited with the first isolation of oxygen. His results were published in 1774. The gas was obtained by heating mercuric oxide and isolated by collection over mercury in a pneumatic trough. He recognized the fact that substances burned more brilliantly in this gas than in air and that it supported life. However, he failed completely to realize that the true explanation of the nature of combustion was in his hands. Even after his meeting with Lavoisier he remained unconvinced. He predicted the use of oxygen in medicine.—Timm, John A., in *Development of the Sciences*, New Haven, Conn., Yale University Press, 1941.

THE TREATMENT OF PARKINSONISM

RESULTS OBTAINED WITH WINE OF BULGARIAN
BELLADONNA AND THE ALKALOIDS OF
THE U. S. P. BELLADONNA

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Ivan Raeff, of Chipka, Bulgaria, a biologist, in 1926 made a decoction of the root of the Bulgarian belladonna plant with wine and instituted an elaborate procedure for the treatment of parkinsonism. Most astonishing results were claimed. Since Raeff's study there have been many reports in the literature on the use of Bulgarian belladonna.¹ Elaborate side measures which were part of the therapeutic program of some investigators included change in environment, special nursing care, physical therapy, systematic exercises and occupational therapy. In addition, the psychologic effect of the sympathy and attention given the patients must have been considerable.

It has been stated that in the treatment of patients with parkinsonism Bulgarian belladonna has a value superior to that of the belladonna grown in other countries. This claim has not been supported by the results of investigators using the English, Italian or German root. It was the purpose of our study to investigate the therapeutic effect of the wine decoction of Bulgarian belladonna on the symptoms of parkinsonism and to determine whether there was any specific action of the white wine decoction of the Bulgarian belladonna which could not be obtained with the alkaloids of the U. S. P. belladonna or with the Bulgarian belladonna administered in forms other than the white wine decoction.

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The wine and hydroalcoholic extracts of both the Bulgarian and the U. S. P. belladonna root and the desiccated white wine extract of U. S. P. belladonna were furnished by the William S. Merrell Company and the compound of the belladonna alkaloids by Sharp & Dohme.

I. These reports include:

Bailey, A. E.: Bulgarian Belladonna Root, *Pharm. J.* 140:77 and 567, 1938.

Fabing, H. D.: Bulgarian Belladonna Treatment of Postencephalitic Parkinsonism Syndrome, *Ohio State M. J.* 35:1195, 1939.

Ferrannini, L.: La cura bulgara di alcuni postumi di encefalite letargica, *Policlinico (sez. prat.)* 42:967 and 1544, 1935.

Forster, E. M.: Treatment of Parkinsonism Syndrome, *Pennsylvania M. J.* 42:67, 1939.

Gayle, R. F., Jr.: Treatment of Parkinsonism with a Preparation of Belladonna Root: Preliminary Report, *Virginia M. Monthly* 66:707, 1939.

Henricksen, R. H.: Bulgarian Belladonna, *Pharm. J.* 140:240, 1938;

141:522, 1938; Bulgarian Treatment of Postencephalitic Parkinsonism, *Lancet* 2:1141, 1938.

Hill, D.: Bulgarian Treatment of Postencephalitic Parkinsonism: Comparison with English Belladonna, *ibid.* 2:1048, 1938.

Lewenstein, H.: Die Behandlung der Folgezustände der Encephalitis epidemica mit hohen Atropindosen, *Deutsche med. Wchnschr.* 57:1014, 1931.

di Mattei, P.: Sulla così detta "cura bulgara" dei postumi di encefalite epidemica, *Policlinico (sez. prat.)* 42:501, 1935.

Ncal, J. B.: Bulgarian Belladonna Treatment of Chronic Encephalitis: Preliminary Report, *New York State J. Med.* 39:1875, 1939.

Neuwahl, F. J.: Treatment of Postencephalitic Parkinsonism with Bulgarian Belladonna, *Lancet* 1:693, 1939.

Neuwahl, F. J., and Fenwick, C. C.: Bulgarian Treatment of Postencephalitic Parkinsonism, *ibid.* 2:619, 1937.

Panegrossi, G.: Ueber die neue Heilmethode der chronischen epidemischen Encephalitis mit Parkinson-Erscheinungen, *Deutsche med. Wchnschr.* 64:669, 1938.

Roemer, C.: Zur Atropinbehandlung der encephalitischen Folgezustände, *München. med. Wchnschr.* 77:2156, 1930; Zur Therapie der encephalitischen Folgezustände (Atropin in hohen Dosen, Atropin-Pulokarpin, Eustatena), *Med. Klin.* 28:224, 1932; Die Atropinbehandlung des Parkinsonismus, *Med. Welt* 6:1127, 1932.

Taylor, S. A., and Hobart, F. G.: Bulgarian Belladonna, *Pharm. J.* 141:49, 1938.

Tecce, L.: Osservazioni e ricerche sulla cura bulgara del parkinsonismo postencefalico, *Rassegna di terap. e pat. clin.* 8:154, 1936.

Vollmer, Hermann: Bulgarian Treatment of Postencephalitic Parkinsonism, *N. Y. M. Sinat Hosp.* 6:93, 1939; Bulgarian Treatment of Parkinson's Disease: Pharmacologic Aspects and Clinical Effects of Alkaloids of Belladonna Root, *Arch. Neurol. & Psychiat.* 43:1057 (June) 1940.

von Wittenberg, H.: Behandlung der chronischen Encephalitis mit der "bulgarischen Kur," *Klin.* 1938.

tion. With these aims in view we treated 71 patients with the following preparations: (1) white wine extract of Bulgarian belladonna root;² (2) desiccated white wine extract of U. S. P. belladonna root,³ and (3) tablets containing a combination of the alkaloids of the belladonna root (hyoscyamine, atropine and scopolamine).⁴

In addition, the Bulgarian belladonna was given in a hydroalcoholic extract² and the U. S. P. belladonna in both white wine extract² and hydroalcoholic extract.²

The patients used in this study all were suffering from parkinsonism, and no attempt was made to select them according to the severity of the symptoms or the etiologic factors in their disease. The treatment was given in the wards or the outpatient department of the Neurological Unit of the Boston City Hospital or in the wards of the Long Island Hospital (the city hospital for patients with chronic diseases). An attempt was made to keep the environment during the study the same as that prior to the administration of treatment. Physical therapy was not given, and encouragement or other forms of psychotherapy were avoided as far as possible.

METHOD OF ADMINISTRATION

The treatment was started with a dose of 0.1 to 0.2 mg. given one to four times a day. This dose was increased by increments of 0.1 to 0.2 mg. at intervals of one to three days until the appearance of untoward side reactions made further increases inadvisable. The optimum dose was then determined by gradually decreasing the total daily amount until a dose was obtained which gave the maximum relief from the symptoms of the parkinsonism with a minimum or tolerable amount of side symptoms.

RESULTS

The degree of relief of symptoms was graded from "none" to "maximal," as follows: "minimal," subjective improvement and some lessening of nursing care; "slight," definite improvement in ability to get around and feed self, and much less need for nursing care; "moderate," the foregoing, with the addition of objective improvement in rigidity, tremor, speech, facies, posture and partial economic and social rehabilitation; "maximal," complete or almost complete clinical abatement of symptoms with complete or almost complete economic and social rehabilitation.

The results obtained with the three preparations which formed the major part of this study are shown in table 1. These results indicate that there was little difference in the therapeutic effects of the three preparations. The figures shown in this table could be interpreted as indicating that the best results were obtained with the desiccated white wine extract of U. S. P. belladonna, but the relatively small number of cases and other factors must be taken into consideration; for example, many of the patients treated with the compound of belladonna alkaloids were chronically bedridden. It was found, furthermore, that the majority of the patients could be changed from one preparation to

2. A white wine extract or hydroalcoholic extract of both the Bulgarian and the U. S. P. belladonna root prepared by the Wm. S. Merrell Co. after the method of Neuwahl and Fenwick to contain not more than 0.0173 Gm. or less than 0.0132 Gm. of total alkaloid per hundred cubic centimeters.

3. White wine extract of U. S. P. belladonna prepared by Wm. S. Merrell Co. in the same manner as described, desiccated and pressed into tablets containing 0.4 mg. or 0.8 mg. of total alkaloid, marketed under the trade name of "Vinobol."

4. Alkaloids of U. S. P. belladonna combined in tablet form, each tablet containing hyoscyamine 0.4507 mg., atropine sulfate 0.0372 mg. and scopolamine hydrobromide 0.0119 mg., marketed under the trade name "Rabellon" by Sharp & Dohme.

another without appreciable difference in the therapeutic results. Nine of the 71 were treated at different times with each of the three preparations, and, although there were some individual variations, the therapeutic results were practically the same with all three preparations (table 2).

The hydroalcoholic extract of Bulgarian belladonna and wine and hydroalcoholic extract of U. S. P. bella-

TABLE 1.—Results of Treatment of Parkinsonism

Medication	Severity of Symptoms	Degree of Improvement				
		None	Minimal	Slight	Mod-Maximal	Total
Wine of Bulgarian belladonna..	Mild	3	7	1	2	17
	Severe	9	13	13	8	43
Desiccated white wine extract of U. S. P. belladonna	Mild	0	1	0	1	6
	Severe	3	12	5	1	23
Compound of belladonna alkaloids	Mild	0	2	2	1	7
	Severe	6	6	2	4	19
Total.....	Mild	3	10	3	4	30
	Severe	18	31	20	13	85

donna were administered to 8 patients both as initial and as substitutive therapy for wine of Bulgarian belladonna. Initial and substitutive therapy with these two preparations gave therapeutic and toxic side effects identical with those obtained with the white wine extract of Bulgarian belladonna.

Although it is known that patients suffering from parkinsonism are apt to experience subjective improvement with any new treatment, an attempt was made to compare the results obtained in this study with those previously obtained in the same patients with their former modes of therapy (usually stramonium pills or scopolamine hydrobromide tablets). The results as given by 45 patients were (1) no better 15, (2) worse 5 and (3) better 25. Thirty-four of these 45 patients had been under our care for several to many years and had been given various therapeutic agents. Five obtained a greater degree of improvement with the new treatment, 28 obtained equivalent results and 1 was made worse. Former therapy had been definitely effective in 8 and of no benefit in 2 of the 14 patients who were moderately or maximally improved with the wine of Bulgarian belladonna (table 1). The results in 4 could not be compared. Former therapy had been ineffective in 10 of the 12 patients who failed to respond to wine. In 1 the treatments could not be compared and 1 had been moderately relieved by atropine.

In the analysis of our results the following factors seemed to be of importance in regard to the effects of treatments:

1. Cause of the symptoms: Benefit from the treatment was obtained by 89 per cent of the patients with a history of encephalitis preceding the onset of symp-

TABLE 2.—Results of Treatment with All Three Preparations in Nine Cases

Patient	Age	Duration of Symptoms	Cause of Symptoms	Severity of Symptoms	Degree of Improvement with		
					Wine of Bulgarian Belladonna	Desiccated White Wine Extract of U. S. P. Belladonna	Compound of Belladonna Alkaloids
1. L. B.	35	19	Encephalitis	Severe	Slight	Slight	Slight
2. H. B.	51	10	Encephalitis	Severe	Slight	Minimal	Slight
3. G. C.	58	2	Arteriosclerosis	Moderate	Minimal	Minimal	Slight
4. R. E.	56	9	Unknown	Moderate	Maximal	Maximal	Maximal
5. P. G.	50	10	Encephalitis	Severe	None	Minimal	Minimal
6. P. K.	56	3	Arteriosclerosis	Moderate	Maximal	Moderate	Moderate
7. R. M.	56	2	Arteriosclerosis	Moderate	Maximal	Maximal	Maximal
8. M. S.	41	19	Encephalitis	Severe	Moderate	Maximal	Maximal
9. M. Y.	66	1	Arteriosclerosis	Severe	None	None	None

The use of dry white wine, carrier of the decoction preparations, as initial therapy failed to alter the symptoms of parkinsonism of 4 patients, and substitution therapy with the white wine caused a regression to the pretreatment status of 2 patients who had responded favorably to therapy with wine of Bulgarian belladonna, and there was no change in the condition of 2 patients who had failed to respond to the therapy with white wine of Bulgarian belladonna.

Since the results of these various compounds on the total picture and the individual symptoms of the disease were almost identical, there is no need for a separate discussion in summarizing our results. Doses when given are in milligrams of total alkaloid.

The results obtained in the 71 cases can be summarized as follows: no improvement 20 per cent, minimal improvement 31 per cent, slight improvement 25 per cent, moderate improvement 17 per cent and maximal improvement 7 per cent.

The treatment was discontinued in 17 cases, and there was a regression to the pretreatment status in 16 of the 17 within ten days, sometimes developing as early as twenty-four hours but usually in two to five days. One patient whose tremor had been relieved by treatment continued to be free of the tremor after the treatment was withdrawn. He had had several spontaneous remissions of the tremor in the past.

toms as compared to 24 per cent of those whose symptoms presumably were due to arteriosclerosis.

2. Age at onset of symptoms: Eighty-five per cent of the patients with onset of symptoms before the age of 40 were improved as contrasted to 70 per cent in the group with onset after the age of 40.

3. Duration of symptoms: The average duration of symptoms in the group of patients who were improved by the treatment was seven years as compared to twelve years in the group whose symptoms did not respond to treatment.

4. Character of symptoms: As a rule the symptoms of excessive salivation and a subjective sense of muscular rigidity almost always responded to treatment. Objective muscular rigidity, "cogwheel" phenomena, with associated poverty of motion, propulsions or retropulsions, flexor habitus, oculogyric crises and tremor responded well to the treatment in some instances and in others were little affected. Abnormal speech, mask-like facies, tics and loss of associated movements were the symptoms which were most difficult to influence.

When the major part of the clinical syndrome was rigidity the results were more favorable. Improvement was obtained in 85 per cent of the group with this symptom as compared to 65 per cent of the group in which tremor was the principal clinical manifestation.

TOXICITY

The amount of the wine of Bulgarian belladonna which could be taken by the patients varied widely, namely between 0.4 and 12 mg. a day. The average maximum dose in the 60 cases was 3.3 mg. The level at which untoward side symptoms developed varied between 0.2 and 2.7 mg., with an average of 1 mg. Larger doses were tolerated by the patients whose symptoms developed as a sequel to encephalitis than by those whose symptoms were due to arteriosclerosis.

One of the experimental and clinical advantages which has been claimed for wine of Bulgarian belladonna is a low toxicity. The relative toxicity of other belladonna preparations used in this study was determined in 38 cases. The level at which toxic symptoms appeared and the maximum tolerated doses were exactly similar for all preparations in all patients, with 1 exception. This patient was able to tolerate only small doses of the wine extract of Bulgarian belladonna but could take large doses of tincture of U. S. P. belladonna.

NATURE OF TOXIC SYMPTOMS

Dryness of the mouth was the most frequent complaint, occurring in 88 per cent of the cases. Blurring of vision was second, with an incidence of 68 per cent. With increase in the dose, urinary retention and impairment of pupillary response to light and accommodation develop. Less frequent toxic manifestations were diplopia, conjunctivitis, photophobia, dysarthria, dizziness, headache, mental confusion, glossitis, dysphagia, gastralgia, diarrhea and constipation. A sense of internal heat and flushing of the skin was infrequent. Blood pressure may be affected by large doses with a decrease in the systolic pressure and an increase in the diastolic pressure. Acute infectious diseases lower the tolerance of the patient, as does excessively hot weather. One patient suffered a "heat stroke" after direct exposure to the sun for one hour in midsummer. Arteriosclerotic heart disease, angina pectoris, severe general arteriosclerosis, mental disturbances, chronic nephritis, glaucoma, malnutrition, general debility and dehydration contraindicate the use of the belladonna drugs.

Three of the original 71 patients have died. A young man with severe symptoms committed suicide by jumping from a seventh story window. A middle-aged woman with severe symptoms was found dead in bed one morning. She had had no therapy for a period of four to five days. A middle-aged Chinese with severe symptoms succumbed to repeated gastric hemorrhages while taking wine of Bulgarian belladonna in the dose of 1.6 mg. daily. Postmortem examination revealed no anatomic or pathologic explanation for the hemorrhages.

Treatment of the toxic symptoms does not yield good results. Blurring of vision may be helped by the use of lenses correcting the disturbance in accommodation. Dryness of the mouth is combated by constantly keeping rock candy, lemon drops, a small pebble or chewing gum in the mouth. The drugs available for treatment of these symptoms are only moderately efficient and have undesirable effects in themselves. Physostigmine as an ophthalmic ointment or as an aqueous solution of 0.25 to 0.5 per cent may be used for blurring of vision, but local irritation prevents prolonged use. Pilocarpine hydrochloride (1 per cent solution) may also be used. Twitching of the intrinsic muscles of the eye may become annoying. Pilocarpine hydrochloride, in the dose of $\frac{1}{12}$ to $\frac{1}{6}$ grain (0.005 to 0.01 Gm.) given orally or hypodermically, has been tried, but the occurrence of severe diarrhea, profound general weakness, profuse

sweating and headache makes its use undesirable. Care must be taken not to use pilocarpine in the presence of "shock" as seen in "heat stroke."

SUMMARY

1. Wine and hydroalcoholic extracts of Bulgarian and U. S. P. belladonna root, desiccated white wine extract of U. S. P. belladonna and a compound of the belladonna alkaloids were used in treatment of 71 unselected patients with parkinsonism.

2. The results obtained with the three preparations were practically identical.

3. Among 30 patients with symptoms of a mild degree of severity the results were as follows: not improved, 10 per cent; moderately improved, 43 per cent, and greatly improved, 47 per cent. The results obtained on 85 patients with symptoms of severe degree were 22 per cent not improved, 59 per cent moderately improved and 19 per cent greatly improved.

4. The age of onset of 40 years or less, the duration of the syndrome of ten years or less or the history of encephalitis preceding the onset of symptoms enhance the probability of a favorable response.

5. Dryness of the mouth, blurring of vision, impairment of pupillary response to light, urinary retention and impairment of pupillary response in accommodation are the most frequent toxic symptoms. An increase in the dose beyond the level producing these symptoms may cause mental confusion, dysarthria, dysphagia, headache, diplopia, diarrhea or constipation.

6. Contraindications to the use of these drugs are advanced arteriosclerotic disease of the heart or the peripheral vessels, disturbances of the mental condition, chronic nephritis, glaucoma, malnutrition and dehydration.

7. The alkaloids derived from the root of the belladonna plant irrespective of its geographic origin are valuable in the treatment of parkinsonism.

PLASTIC FLAP IN SURGERY OF
THE TONSILS

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Today the surgeon in almost every instance can assure the patient that the tonsils will be successfully removed—the tonsil, the whole tonsil and nothing but the tonsil—without injury to the other structures of the throat; yet four decades ago such assurance was the exception rather than the rule. Up to the turn of the century tonsillotomy (partial removal) was practiced, and the use of that operation continued through the first decade; in the second decade of this century too much was removed; automatic instruments came into vogue which stripped away from the throat a thin sheet of muscle; in the third and fourth decades standards of removal of the tonsils have been improved until a "muscle free dissection" is the common aim of all.

MUSCLE FREE DISSECTION

Anatomic research has shown that the tonsil is not a spherical cyst with a thick capsule, as has been believed, but is instead a complicated double pocket composed of two lobes marked off from each other by an hourglass constriction. The so-called capsule is an artefact, the first layer stripped from the fascia between the tonsillar tissue and muscles. The fascia may be regarded as a fine network of fibrous bands. It is the undifferentiated areolar tissue between the well defined

lymphoid tissue of the tonsil and the equally well defined muscle tissue lateral to it. Instead of having a ready-made capsule, the lymph-lined double pocket which is the tonsil is closely bound to the muscles of the pillars and firmly attached to them by strong fibers of the

based on anatomic lines which nature follows in the repair. There must be no sewing together of the two pillars. Each muscular pillar can be promptly protected with mucosa at the time of operation.

REPAIR OF THE TONSILLAR FOSSA

The new plan of repair designed to minimize convalescence by partially covering the exposed portion of the pillars with a protective mucous membrane at the time of operation obviates the most severe pain and discomfort later. The patient eats breakfast the next morning. The time for the wound to cover over is lessened by half, and the amount of scarring is almost nil. No longer does tonsillectomy involve a large open wound set to catch food and become infected and so entail great discomfort and soreness for ten days. Rather it has become a question of how successful the surgeon has been in covering the most vulnerable and sensitive part of the wound and quickening the healing forces of nature to repair the throat with a minimum of discomfort, distortion and disturbance of function.

DESIGN FOR PLASTIC FLAPS (RETROTONSILLAR, SUPRATONSILLAR AND PRETONSILLAR INCISIONS)

The first step is freeing the plica retrotonsillaris.

An incision is made, starting at the base of the tongue at the lower pole of the tonsil and behind any infratonsillar lingual nodules which may be present. It is carried upward along the posterior attachments of the mucous membrane, which are freed little by

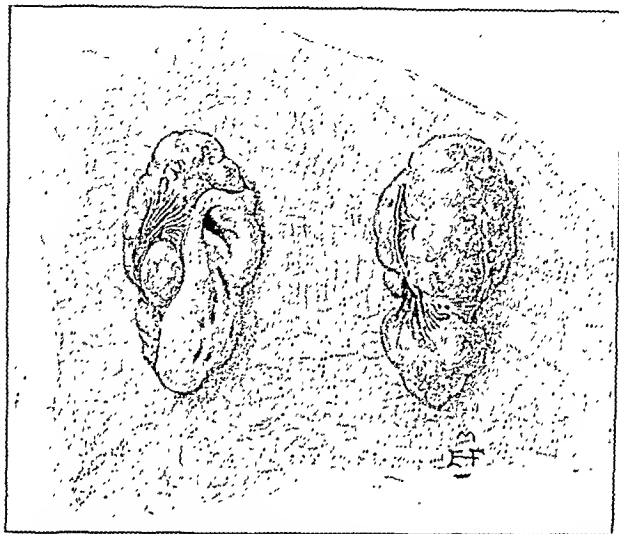


Fig. 1.—Corpus delicti. Quilted appearance of surface of tonsil after removal by meticulous "muscle free dissection."

pharyngeal fascia. Over the upper lobe or pocket the layers of this pharyngeal fascia are easily split apart in the process of dissection over the submerged surface of the upper lobe. For this reason the first half of the operation runs off smoothly, but the dissection of the lower half of the tonsil, the hourglass constriction and the submerged surface of the lower lobe, is more difficult; it requires greater force and more accurate study for a definite reason: In this area the muscles are firmly anchored to the tonsil, their fascial fibers terminating between the lobules in the connective tissue trabeculae.

In figure 1 is shown a pair of tonsils which have been gently removed and freshly laid on a piece of gauze. Just below the middle is seen the hourglass constriction which marks off the large upper lobe or pocket from the smaller lower lobe or pocket, and the attachments of the muscle are shown cut short against the surface of the tonsil. The appearance of the surface of both upper and lower lobes is that of being quilted because of the pull of the trabeculae when only a single intimate layer of the submucosa remains to cover the lymphoid tissue of the tonsil. This quilted appearance of the fascia on the surface of the tonsil after removal and the short stumps of the muscle at the hourglass constriction are evidences of what has been a successful "muscle free dissection."

PLASTIC FLAPS IN SURGERY OF THE TONSILS

For fifty years we have seen the tonsillar fossa neglected after all traditional operations and the whole raw surface of the wound after enucleation left exposed to every accident of trauma from food in the throat and to its full quota of infection. There is something fundamentally wrong here.

It takes but a minute to cut a flap at the time of the first incision of the mucous membrane; it takes less than a minute when the tonsil has been removed to anchor this flap with a catgut slipknot to the fascia at the center of the wound in such a way as to help nature in the healing. But the technic must be accurate; it takes a deft hand, and the new design must be

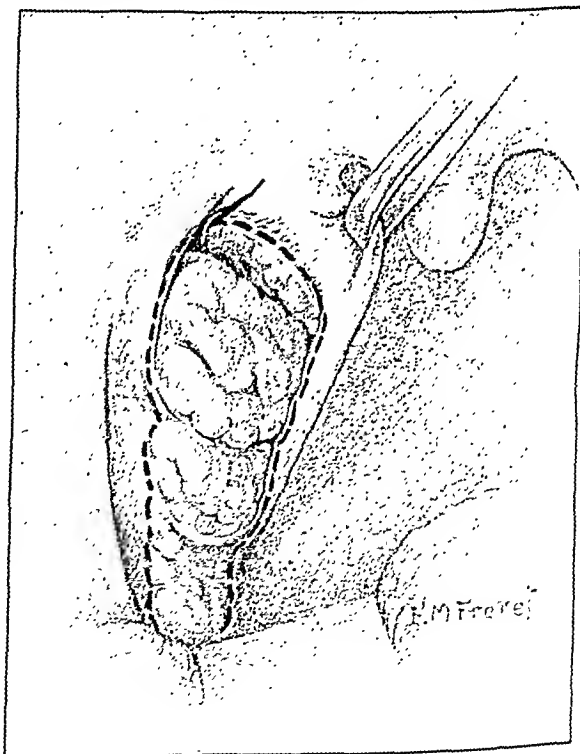


Fig. 2.—Extra incision at top frees anterior pillar from plica semilunaris, drawn taut by Allys clamp.

little where they meet and are attached to the surface of the tonsil. While this is being done the tonsil itself or the posterior pillar is held firm.

The meticulous saving of all mucous membrane for the whole length of the posterior pillar (down to the last eighth of an inch in width) is the aim of this procedure. Its accomplishment is much simplified by use

of a small curved knife set at an angle of 145 degrees which has been designed especially for this purpose.

The structure that is being freed from its attachment to the tonsil is the so-called plica retrotonsillaris. It is left at the end of the operation as a definite strip

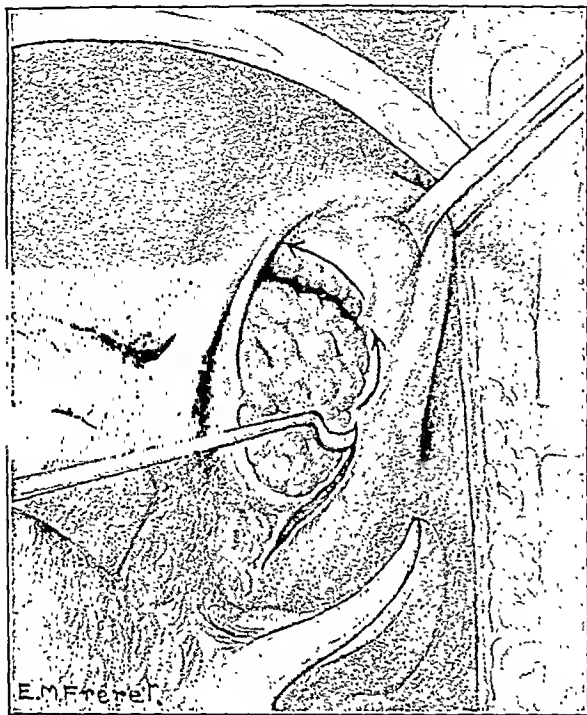


Fig. 3.—Incision up plica retrotonsillaris and plica semilunaris, with sickle knife, at a 145 degree angle.

of mucous membrane running straight or serrated the whole length of the posterior pillar.

The second step is freeing the plica semilunaris. When the incision starting from the base of the tongue has been carried upward past the lower lobe of the tonsil and past the hourglass constriction at the junction of the upper and the lower lobe and continued upward along the posterior attachment of the tonsil, freeing it from the posterior pillar (palatopharyngeus muscle), the cutting edge of the knife is directed forward along the edge of the plica semilunaris, which covers the upper pole of the tonsil. The blade is introduced under the mucous membrane and cuts "to the open." This sweep forward is continued as far as the edge of the anterior pillar (palatoglossus muscle), and at this point instead of going down, the incision turns upward and outward for a quarter of an inch. This significant extra incision when it joins the other incision frees the plastic flap from the anterior pillar. In this procedure lies the key to later success. In figure 3 is explained the theory of the three steps in the incision before they are united, and the important deviation, for $\frac{1}{4}$ inch at the top, from the classic horseshoe incision is shown as though it were a separate incision.

The third step is freeing the plica triangularis. The path of the knife is reversed; instead of following the edge of the anterior pillar above the tonsil it now retraces the quarter inch incision previously mentioned, and starting at the upper extremity of the plica triangularis the cutting edge of the knife is carried inward and downward, then slightly backward, following near the free edge of the plica triangularis and dissecting from the tonsil the greater part of the mucous membrane from the plica.

Fetterolf, in 1912, pointed out the ease with which the capsule (single layer of fascia) of the tonsil could be separated from the mucous membrane over the plica triangularis. This third part of the incision is based on the facts that he made so clear, and it is designed to recapture from the plica triangularis as much mucous membrane as can be saved (for plastic repair) without leaving any lymphoid tissue in the throat. The surgeon's judgment is called into play at the lower part of the plica triangularis to complete this incision near the base of the tongue short of, that is in front of, the infratonsillar nodules. In some cases it is necessary to bring the incision forward to avoid the lymphoid tissue that involves the surface between the lower pole and the base of the tongue.

A complete circumcision has thus been reached by the following steps: (1) incision up the posterior border, freeing the mucosa of the plica retrotonsillaris from its attachment to the tonsillar capsule; (2) incision forward to and up the edge of the anterior pillar along the free edge of the plica semilunaris, stripping the mucosa of the plica semilunaris from the capsule above the tonsil and from the muscle of the anterior pillar (palatoglossus), and (3) incision downward and inward near the free edge of the plica triangularis to the base of the tongue again in front of the infratonsillar nodules, stripping the mucous membrane of the plica triangularis from the capsule in front of the tonsil.

Each of these steps is designed to recapture all the available redundant mucous membrane that is free of lymphoid tissue. The combined effect of these

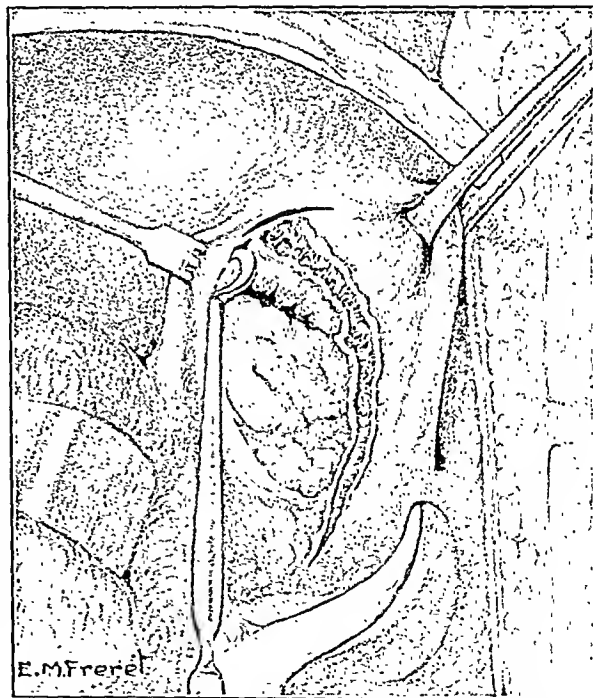


Fig. 4.—Incisions (1) retrotonsillaris and semilunaris (2) semilunaris from palatoglossus and (3) down free edge of plica triangularis.

incisions is designed (1) to leave a small loose flap of plica triangularis to cover in generously the edge of the anterior pillar and (2) to provide a much larger anchored flap including all the mucosa of the plica semilunaris and the plica retrotonsillaris for one major lapel to cover the posterior pillar. Finally, the incisions have separated these two flaps, the small for the ante-

rior and the large for the posterior pillar, freeing them from each other above and below.

A description of the various steps of operation between the incision and the final step of repair¹ is omitted from this paper except to note that after a dissection of the variety described there is left in the fossa a bundle of muscles which have been freed from the belt of the tonsil.

The bundle of muscle and fascia retracts upward and together with the vessels at the junction of the posterior pillar and the lateral wall forms the so-called bib of fascia and veins at the center of the fossa. It thus forms one of the elements used in repair; the other element is the flap of mucous membrane to which it will be joined.

After the removal of the tonsil, at the time at which the surgeon generally puts a ligature on the vessels at the center of the fossa, a new and simple step is introduced—the inclusion into the tie of the edge of the mucous membrane. This creates a situation of tension. It unites the mucous membrane from the plica semilunaris to a fold or "bib" of fascia at the center of the fossa. The little knot that holds them together must be applied so that the union of these two elastic elements is harmonious and the strain is slight.

The strain above and in front of the knot draws the summit of the fossa downward and backward, lessening the dead space, and at the same time and to the same degree the counterpull on the flap of mucous membrane draws it upward, outward and forward, so that as long as the tie holds it is an anchor point drawing toward it the upper part of the wound like a collapsing balloon

covers itself with mucous membrane to the same extent that it would in three weeks if no ties were placed or if all the mucous membrane had been destroyed. These knots automatically disappear about the fifth day, leaving the flap firmly in place.

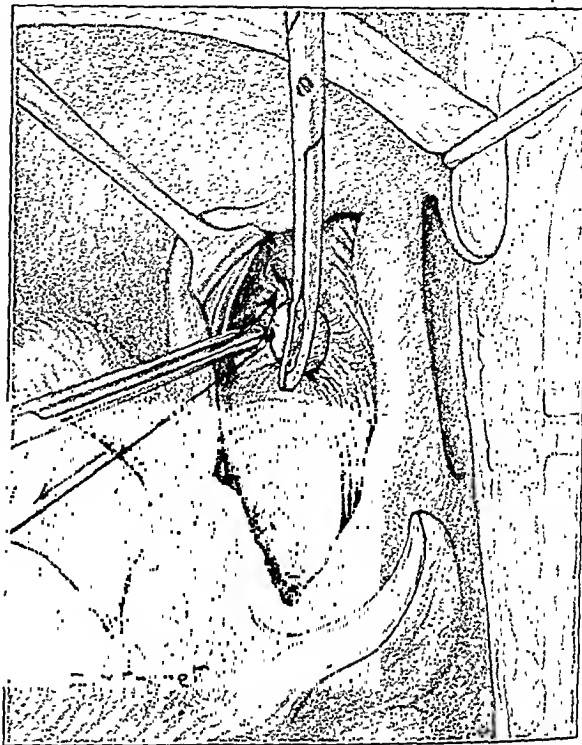


Fig. 6.—Catgut tie, main vessels, muscles and fascia at hilus.



Fig. 5.—Undercutting major flap for posterior pillar, splitting layers of fascia.

and with an even counterpull drawing toward the same point the mucous membrane over the posterior pillar like a roller towel.

With one or two such well placed ties or sutures at the edge of a generous flap it is astonishing to see that in the first week the wound flattens out, collapses and

In trying to account for this result it will be noted that there are a thousand invisible strands of pharyngeal fascia backed by the full, strong palatopharyngeus muscle attached to the hard palate above, which gives this pull its strength and creates a gliding flap which covers up the raw area with progressive steps from day to day.

REVIEW

Thus when the tonsil has been removed and any bleeding vessels tied (whether this is done under local anesthesia or general anesthesia makes no difference), a radically new step is introduced. The technic of this new step requires a study of detail. The mucosa at the edge of the posterior pillar is drawn gently toward the center of the fossa and is joined to fascia in the upper part by two ligatures of no. 1 catgut.

To retract the upper part of the wound, drawing the palatoglossus muscle at a level of the base of the uvula upward and outward with a Hurd retractor is a great help at this point, for this procedure narrows the fossa at the top and draws the mucosa over the edge of the posterior pillar not too far from its destined anchorage. There is a trick in the use of the Allys clamp at this stage. It seizes the edge of the mucous membrane and draws it upward and outward.

When the right position is reached one point of the Allys clamp is used to pin the mucous membrane in place while the clamp is slightly opened and allowed to engage the fascia. The trick lies in pressure on the first point of the clamp while it is open so that the mucosa does not slip away while the fold of muscle and fascia is being engaged by the other point. After this it is easy to apply a slipknot of no. 1 catgut just as in the usual technic in tying a vessel. The difference

1. Fowler, R. H.: Tonsil Surgery. Philadelphia, W. B. Davis Company, 1930, chapter 10.

is that in this case there is more material to tie down and the knot is pulled firm before the Allys clamp is removed and the catgut trimmed with scissors.

IMPORTANCE OF FASCIA IN THE TONSILLAR FOSSA

Investigation of the anatomy of the pharynx related to tonsillar surgery has brought out the importance of the pharyngeal fascia subjacent to the tonsil which is composed of the sheaths of the neighboring muscles, especially the palatopharyngeus, the palatoglossus, the superior constrictor and, to a lesser extent, the stylopharyngeus. Fascia is the undifferentiated tissue filling in the space between muscles, protecting the muscles and providing for their interplay. It is through the spaces of the fascia that the nerves, the veins and the arteries find their way. In fact, the tonsil operation is possible only because this strong, undifferentiated fibrous tissue can be separated into sheets. Anatomically considered, the removal of the tonsil is the problem of stripping away the mucosa (the surface of the throat) between the anterior and posterior pillars, lined as it is with lymphoid tissue, from the submucosa (pharyngeal fascia). In attempting to improve this operation it is of the highest importance to become familiar with the reconstruction of the fossa of the normal throat and to realize that the pharyngeal fascia of the fossa is attached above to the palate, to the styloid process and to the base of the skull. It stretches a network of fibrous tissue over the tonsillar fossa which not only forms the so-called capsule (the single layer that must be stripped away with the tonsil to hold it together) but also forms layers which may be left as a protective covering for the muscles of the fossa and the greatest single aid to rapid repair.

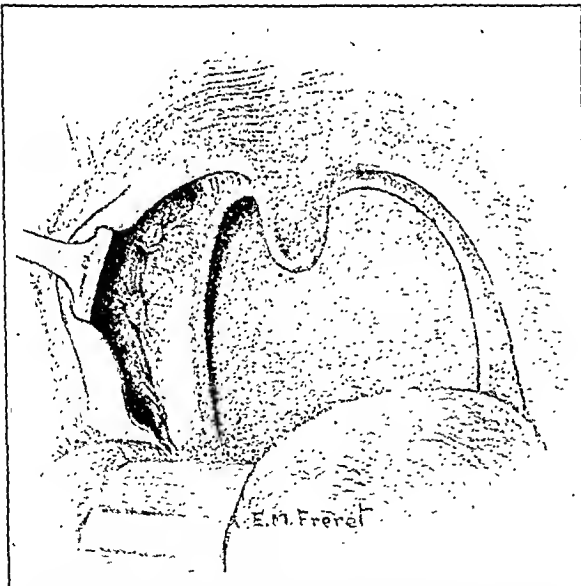


Fig. 7.—The major flap doubly knotted covers most sensitive part of posterior pillar.

On the other hand, when this pharyngeal fascia, instead of being left intact to give a sleek curved appearance in the fossa, is torn and harrowed by less sensitive and accurate dissections, the appearance of the fossa after the operation is changed from curved to angular lines. Once the network of fascia is torn, muscles of the pillars are revealed and exposed running at right angles to each other. The purpose of "muscle free dis-

section" of the tonsil is not only to leave the muscles of the fossa intact but to leave them covered with fascia.

The network of elastic tissue that is called fascia preserves the relationship of the muscles and insures their function six months after operation. When the fascia is left unbroken the muscles are unencumbered with scars and have their natural elasticity.

Fascia functions to support and give free play to muscles. Wherever it is damaged there is lessened function. Therefore it is of great surgical importance to preserve it.

COMMENT

Those who have learned to do a "muscle free dissection" and have learned to leave a fringe of mucous membrane the whole length of the posterior pillar will find plastic surgery of the tonsillar fossa fairly simple.

The posterior pillar flap is the size of a small finger nail. The successful operator can tie it in without a moment of added time when he is tying off the vessels. Perhaps it is better to give them the benefit of a tie of their own, so that the strain on the flap cannot complicate the closure of these vessels. The two elements fascia and mucous membrane are both elastic; when combined, they lend themselves to coordination and can be coaxed together with an Allys clamp. A knot of plain no. 1 catgut can then be used to unite them and thus anchor to a bit of jettisoned muscle a floating plastic flap which will cover progressively and protect the upper half of the exposed surface of the posterior pillar. It is then a simple matter to place a second tie to anchor the edge of the mucosa in exactly the same way, a quarter of an inch below the first, to the fascia at the center of the fossa, where there are large veins. Five days later the shrinkage of the wound causes the flap to cover in a greater area. Resorption and shrinkage of the muscle contract the wound at this stage of repair, and the floating flap by advancing restricts the area to be repaired by granulations (secondary intention).

As for the anterior pillar, it is well to leave as much of the mucosa from the plica triangularis as is free of lymphoid tissue to aid in the repair. This needs no ties or sutures. The saving of the mucous membrane at the time of the first incisions made during the operation makes the greatest difference to the comfort of the patient, even if no knots are used.

Study of the repair of the wound after a tonsillectomy shows that the most vulnerable and sensitive area is the exposed surface of the posterior pillar, for three reasons: its function in swallowing, its exposure to food and its neural supply from the glossopharyngeal nerve. From this fact it follows that the greatest help in assuaging pain and discomfort results from the plastic covering of this sensitive posterior pillar. Practically it works out that way. Some patients experience hardly any discomfort at all, eating breakfast without complaint the morning after the operation.

The difficulties of accomplishing this apparently simple procedure are numerous. In small children the available mucous membrane is on a miniature scale and is easily torn. In older persons there is plenty of material both in mucosa and well developed fascia. The greatest difficulty is getting a clear conception of the technic of cutting the flap for the posterior pillar to include the mucous membrane the whole length of the posterior pillar and all the plica semilunaris above the tonsil. The second difficulty is understanding the technic of placing the flap. The ties themselves are simple slipknot ties of no. 1 catgut which after five days take care of themselves.

The number of operations in which plastic flaps have been used has run into the thousands. There have not been any bad results—no necrosis and no destruction of the flap. The surgeon is warned to lift the flap upward a quarter of an inch as well as outward so as to avoid distortion by pulling down the palate. The idea is to replace the posterior pillar in its original form, and the flap should be drawn up toward the palate.

SUMMARY

Experiments with plastic surgery in the tonsillar fossa based on study of the anatomy give encouraging results. They tend to show that when the surgeon has carried out the conservation of tissues to a point at which all bundles of muscle originally attached to the tonsil are left in the throat and all the fascia of the throat is stripped from the tonsil except the last single intimate layer holding the lymphoid tissues together, when the tonsil has thus been shaved from the throat as is shown by the quilted appearance of its fascial surface, the surgeon has attained what may be called a "muscle free dissection." Then by the steps described, by conserving and placing all the mucous membrane originally attached to the tonsil, the healing of the wound is accelerated. A special incision separates the mucous membrane of the plica semilunaris and the plica triangularis above. This frees the plica semilunaris and the plica retrotonsillar for a lapel that will cover a large part of the exposed surface of the posterior pillar.

The fascia of the fossa is drawn together and anchored to the edge of the mucosa, where in any case the larger vessels require a ligature (at the junction of the posterior pillar and the lateral wall). A second tie just below that serves to distribute further the tension on both fascia and mucous membrane.

It takes but a minute to cut a flap at the time of the first incision; it takes less than a minute to anchor this with a catgut slipknot to the fascia at the center of the wound in such a way as to help nature in the healing. There must be no sewing together of the two pillars. Each muscular pillar can be promptly protected with mucosa at the time of operation.

149 East Sixty-Second Street.

The Parallel Case of the House Rat.—About the middle of the thirteenth century, with the rise of modern civilization and the growth of world commerce, out of India came the black rat (*Mus rattus*) with long ears and tail and a glossy black coat. This species of rat had learned how to travel in sailing ships; it followed the beginnings of modern commerce over the whole world and as a migrant established itself successfully in nearly every country, where by "natural selection" it destroyed the local native species. *Mus rattus* thus became the "world rat." It held this position with increasing strength for five hundred years; then out of Asia early in the eighteenth century came the brown rat (*Mus norvegicus*), larger, more powerful and more vigorous than its predecessor the world-conquering black rat. Migrating with modern commerce, the brown rat made the practical conquest of the whole world in about one hundred and twenty-five years, practically succeeding the black rat in the title of "world rat." . . . In the rat world the record is not one of conquest by declared war and formal battle but one by the quiet immigration—a few at a time—of members of the invading species, which established itself, reproduced at a high rate, defeated its host-species in hundreds of "personal competitions" and finally succeeded to the ownership of the invaded territory. This, in short, is the biological formula, repeated many times over in the world of plants, animals and man, of conquest by immigration.—Laughlin, Harry H.: *Immigration and Conquest: A Report of the Special Committee on Immigration and Naturalization of the Chamber of Commerce of the State of New York*, May 15, 1939.

SCHOOL HEALTH POLICIES

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The term "school health policies" refers to the procedures that schools establish for protecting and promoting the health of school children. As physicians, regardless of the type of medical work in which we are engaged, we are concerned with these policies. If we are in private practice we are concerned because the children with whom the school is dealing are our patients. If we are in public health we are concerned because of needed coordination between school health education and public health activities, as well as because some communities place responsibilities for many school health activities on departments of health. Our interest in school health policies is particularly keen if we happen to be members of boards of education or are employed by boards of education as school medical advisors. If the former, we have the responsibility of deciding on policies for school health activities, and, if the latter, we must develop procedures in keeping with established policies. Further than this, as physicians we are interested in the health of all people, and we want to know if our schools are doing all they should to protect the health of school children, to give them guidance with health problems and to instruct them concerning the maintenance of health and ways in which they may be protected against disease.

As we study school health programs we are amazed to find the variations that exist. One city spends thousands of dollars on improving pupils' posture but conducts no tuberculosis case finding program, while a neighboring city does nothing about posture but does extensive testing with tuberculin. In a similar manner some schools spend considerable sums on smallpox vaccination and diphtheria immunization while others feel that schools should not be concerned with these matters. Health instruction in some schools is limited to elementary grade pupils, and the failure to develop high school health education means that pupils graduate with little or no scientific information concerning the maintenance of health and the prevention of disease. These extreme variations are the direct results of inadequate planning and the absence of clearcut statements of what schools should and should not do in the field of health.

A report entitled "Suggested School Health Policies" is an attempt to remedy some of these confusing situations. This report, based on a preliminary study made by the Joint Committee on Health Problems in Education of the National Education Association and American Medical Association, was first presented to the Maternal and Child Health section of the American Public Health Association. It was later referred to the following eight national organizations or committees:

1. American Association for Health, Physical Education and Recreation.

Read in the Fifth Symposium on Health Problems in Education at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 3, 1941.

1. "Suggested School Health Policies" was published in *THE JOURNAL*, April 27 and May 11, 1940, in the *Journal of Health and Physical Education* for May and June 1940 and in *Hygeia* for September, October, November and December 1940. Reprints are available from either the American Medical Association or the American Association for Health, Physical Education and Recreation.

2. American Academy of Pediatrics.
3. American Medical Association.
4. American Public Health Association.
5. American School Health Association.
6. Educational Policies Commission.
7. Joint Committee on Health Problems in Education of the National Education Association and American Medical Association.
8. National Organization for Public Health Nursing.

Each of these groups has been asked to study the preliminary report critically and to suggest modifications and additions for its future revision. Through this procedure the aim is to develop one set of school health policies which will be generally approved by educators, physicians and public health officials.

While it is impossible at this meeting to present the entire policies report, I would like to mention the eight fields of the school health program which it outlines and comment briefly on each.

1. *Provision of a Healthful Environment.*—The need for a healthful school environment is evident to all. The health and safety of school children is endangered by poorly lighted, poorly constructed school buildings or buildings with insanitary drinking fountains, inadequate washing facilities or unsatisfactory provisions for heating. There is need for periodic surveys of the sanitary facilities of school buildings and a program calling for at least an annual inspection of their sanitary condition. During recent years these questions of school sanitation have been given increased attention, but there are still many schools that do not come up to present day standards.

A healthful environment requires more than good sanitation; it requires that thought be given to the emotional tone of classrooms. This is part of the school's mental hygiene program, involving consideration of the health and personality of teachers, the type of teaching methods used, the forms of discipline, the methods of promotion, opportunities for expression of the pupils and the socializing effect of classroom activities. Only through consideration of the effect of these various procedures on the emotional development of pupils can a school be sure that it is providing a "healthful environment" as outlined in "Suggested School Health Policies."

2. *Care of Accidents and Sudden Sickness.*—Accidents are bound to occur at school and children will become sick at school. What should school personnel do in these instances? The policies report states that schools should have a "planned written program for the care of emergencies acknowledging school responsibility for (1) giving immediate care, (2) notifying parents, (3) getting pupils home and (4) guiding parents, where necessary, to sources of further treatment." It continues with the statement:

Detailed instructions concerning the emergency care of various conditions, such as headache, cuts, bruises, dog-bites, suspected fractures, painful menstruation or pain in the abdomen, should be prepared by school physicians and copies distributed to each teacher. In general, it may be stated that ordinary first aid measures should be carried out in case of accidents but that the emergency treatment of sickness usually does not require that school personnel administer medication. The prescribing of acetylsalicylic acid for headache or pain, or the giving of sodium bicarbonate, epsom salt or essence of peppermint is

unsound school policy and unsound health education. Most cases of early sickness will be helped best if the pupil is sent home and medication delayed until the physician makes a diagnosis and determines whether drugs are necessary. By following such a policy, schools will avoid the embarrassment caused by a pupil afflicted with a ruptured appendix because his parents postponed having a physician until they saw what effect the medicine given at school would have, and the equally embarrassing situation of giving acetylsalicylic acid for what turns out to be meningitis or brain tumor. In addition to avoiding embarrassment, the school will be doing good health education because it will be teaching that drugs are not taken for every condition which develops but usually only on the recommendation of one who understands their value, their limitations and their dangers.

3. *Prevention and Control of Communicable Diseases.*—There are many questions related to school policies in regard to the prevention and control of communicable diseases. Although legal responsibility for isolation, quarantine and other control measures are responsibilities of health departments, there are many things that schools can and should do. They should teach pupils and parents about preventive measures, the reasons for isolation and quarantine and the desirability of early care for those sick. They should encourage parents to keep sick children at home and should isolate and then send home those who become sick at school. In addition, they should, in cooperation with health departments, develop procedures to keep children who have had a communicable disease from returning to school while still in a communicable stage.

In regard to vaccination and diphtheria immunization, "Suggested School Health Policies" states:

In each community there should be treatment facilities available for children of all economic levels. In most cases the school personnel will refer parents to their private physician for vaccination and for diphtheria immunization. Where parents cannot afford to pay for the services of a private physician, school personnel will refer children to hospital outpatient clinics, dispensaries, department of health clinics or other facilities which the community provides. As a general rule it is believed undesirable to conduct clinics in schools, although this may be the only way some communities will be able to solve the problem of making treatment available to all.

4. *Health Instruction.*—Health instruction is that part of the school health program which teaches pupils about the functioning of the human body, the causes and prevention of certain diseases and the acquirement and improvement of health and community health problems and programs. It is carried on by classroom teachers, teachers of home-making, biology, physical education and social studies.

"Suggested School Health Policies" contains many suggestions relating to health instruction, but perhaps of greatest interest is the paragraph which emphasizes the need of a scientific attitude toward health. This reads:

Perhaps the greatest value of school health instruction comes from the development of a scientific attitude toward problems of health and disease and a realization that the principles of biology, physics and chemistry are as applicable to the human body as to matter or material elsewhere. It is believed a scientific attitude toward health and disease can break down superstitions and fads and thereby fit pupils to analyze critically the tremendous amount of misleading advertising presented in magazines and over the radio. Practice in distinguishing between fact and fallacy in health problems, learning where to find scientific data and authentic opinions, and studying various types of problems related to quackery and "patent

medicines" are methods to be employed in developing a scientific concept of personal and community health problems.

5. Periodic Health Examinations.—For some time many schools have given emphasis to periodic health examinations. In fact, this emphasis has been so great that many schools feel that they have a complete school health program when all they have is a plan for examinations. And, unfortunately, the emphasis on examinations has been placed on quantity rather than quality.

The report on policies recognizes the need for periodic examinations and suggests that "schools assume responsibility for developing a program of periodic health examinations, and that this program encourages examination of pupils by their private physician." It states further that "it will be necessary for schools to provide examinations for large numbers of pupils whose parents cannot or will not arrange examinations otherwise."

Periodic examinations should be supplemented by the "day by day observation of pupils and the referral for further investigation of pupils who do not seem well . . ."

In regard to the frequency of examinations, "Suggested School Health Policies" notes that there have been differences of opinion on this subject. The report states:

Some advocate annual examinations while others favor three or four examinations during the school life of a child. Further study is needed before a scientific answer can be given. This study will have to consider the cost of examinations and the personnel needed and weigh these factors against the benefits that may accrue. In the opinion of this committee four examinations—two in the elementary school and two during the secondary school—should detect most abnormal conditions affecting growth, health and school progress as well as afford teachers information necessary for understanding pupils and adjusting school programs to their needs. Again, it is emphasized that periodic examinations should be supplemented by the day by day observation of pupils and arrangements whereby those who show evidence of disease or disorder may be examined and, where necessary, helped to secure needed treatment.

6. Special Attention to Pupils Needing Medical or Dental Care.—Saying that schools should give "special attention to pupils needing medical or dental care" is just another way of saying that examinations are not an end in themselves but should be followed by a program to help pupils secure needed treatment.

While emphasizing the importance of a follow-up program, the policies report expresses the view that treatment is not a function of schools. If existing treatment facilities for needy children are inadequate, it is suggested that the schools

obtain specific data indicating the inadequacy . . . and present these data to those in charge of medical and dental relief programs with a plea that adequate facilities be provided. . . . Such a plan is superior to the establishment of treatment clinics in schools. If school clinics are developed they serve only the needs of children in the public schools, while clinics for adults and non-public school pupils may be operated under other administration. To avoid duplication or, at best, dual control it seems better that existing facilities for the medical and dental care of adults and children be increased if necessary so as to care for school children. Another reason for having treatment facilities at places other than the school is that treatment clinics in schools cause confusion as to the responsibility and function of the school health program. The pres-

ence of clinics at schools leads to the assumption that the school is responsible not only for health education and health supervision but for providing medical and dental care to all pupils. Education regarding the use of community facilities is a responsibility for the schools, but if, instead of doing this job, it provides treatment, it will not be teaching pupils and parents how to secure treatment but will be making them dependent on the school for these services. As stated by the White House Conference Report on the School Health Program, "Any policy that does for the individual what he can do for himself leaves him more dependent and less willing to care for himself when the protecting hand is withdrawn." Sound school health education teaches children and parents where and how to get treatment, so that when they leave school and when they are in need of care during vacations they will have learned how health needs may be met.

7. Special Education Programs.—The seventh field of school health activities refers to the adaptation of school programs because of physical limitations or the inauguration of special programs because of certain handicaps. In the first category would come those adaptations which are required in physical education because of cardiac conditions, convalescence, chronic fatigue or poor nutrition. And in the second category would be classes in lip reading for pupils with decidedly impaired hearing, sight-saving classes for the partially seeing and speech correction for those who stutter, lisp or have other impediments to clear speech. These special programs of education do much for handicapped pupils. They function best when the work of the special teacher or special school is closely coordinated with that of the school medical advisor.

8. Supervision and In-Service Training for Teachers.—The eighth, and last, part of the school health program as listed in "Suggested School Health Policies" recognizes the need for coordination of the health efforts of many persons within the school and for the coordination of school health efforts with the health activities of other groups in the community.

To quote from the report:

All school personnel, namely janitors, classroom teachers, teachers of home economics, physical education, biologic sciences and social studies as well as the more strictly health trained people—as physicians, nurses, dentists, dental hygienists and dietitians—are concerned with activities of the school health program. To coordinate these groups so that the school health program will be a smoothly functioning unit without friction or duplication requires considerable planning, effort and diplomacy. Besides coordinating the various threads of health interest within the school, there is need of relating school health activities with the health interests of other groups, such as child welfare associations, departments of health, parent-teacher associations, medical and dental associations, and various clinics, hospitals, and dispensaries.

As stated previously, "Suggested School Health Policies" is a preliminary report. It is hoped that all individuals and groups concerned with or interested in school health programs will criticize the report, point out additional topics that should be included, suggest varying emphasis and in other ways help in the preparation of a better, more complete report. If you have not already done so, may I suggest that you secure a copy of this report and, further, that you plan to discuss its contents at your local medical meeting, with your superintendent of schools, your health officer and with others concerned with the health of school children.

249 High Street.

Clinical Notes, Suggestions and New Instruments

THE USE OF THE MILLER-ABBOTT TUBE IN SUBTOTAL COLECTOMY AND OTHER SURGICAL PROCEDURES

LELAND S. MCKITTRICK, M.D., AND RICHARD WARREN, M.D.
BOSTON

The Miller-Abbott tube for the small intestine has acquired a permanent place in the therapeutic and diagnostic armamentarium of the surgical clinic. Its established uses are (1) in intestinal obstruction,¹ (2) in roentgen diagnosis of lesions of the small intestine² and (3) as an adjunct to operations involving intestinal suture to remove tension from the line of suture.³ We have recently been impressed by its value in an additional group of conditions as a part of the technic of laparotomy. These cases are those in which it is of advantage to decrease the volume of the intraperitoneal contents (cases 1 and 2) or to have a method for the certain identification of intestinal loops (case 3). Its use in decreasing the intraperitoneal volume in operations for ventral hernia has been pointed out by Johnston.⁴ Many others have undoubtedly employed the Miller-Abbott tube in these operations, but we have been unable to find further reports which emphasize this important use of it.

REPORT OF CASES

CASE 1.—A Jewish girl aged 16, unmarried, was admitted to the Massachusetts General Hospital Feb. 12, 1940 because of bloody stools of one year's duration and diarrhea for one month. A diagnosis of chronic ulcerative colitis was made by proctoscopy. The patient's course was stormy and febrile. She did not respond to therapy with barbiturates and responded only poorly to sodium sulfapyridine given intravenously. In spite of six transfusions she continued to lose ground, and ileostomy was performed on March 28. Her course after this was complicated by digestion and infection of the wound around the ileostomy, infections of the upper part of the respiratory tract and of the middle ear and hypoprothrombinemia. She was not able to leave the hospital until June 14.

She returned to the hospital on July 15 because of exacerbation of infection in the colon and acute arthritis of the left wrist and fingers and of the right knee and hip. She again ran a febrile course and became an extremely difficult problem in nutrition, but after ten weeks of preparation with high vitamin therapy, transfusions and a course of intravenous injections of sodium sulfapyridine a subtotal colectomy was attempted (L. S. McK.) on September 25. In spite of the fact that the patient had no clinical distention it was found at laparotomy that the small intestine was so dilated from her general atonia that adequate exposure to perform the operation safely could not be obtained. It was decided to close the abdomen and operate at a later date with the Miller-Abbott tube in place. This was done on November 19 (L. S. McK.), after the tube had been passing thirty-six hours and had appeared at the ileostomy. Only 3 feet (90 cm.) of tube was passed beyond the nostril to accomplish this. At operation the short segment of tube which lay within the small bowel had so emptied

and threaded the intestine onto it that the operation was technically the easiest colectomy in the experience of the operator (fig. 1). Subsequent convalescence was uneventful.

CASE 2.—A married woman aged 39 was admitted to the hospital Nov. 20, 1940 because of menorrhagia for four months. A diagnosis of laceration of the cervix and chronic cervicitis was made in addition to that of uterine bleeding. After six days of study and preparation in the hospital a total hysterectomy was performed. Four days after operation the patient showed evidence of an infection of the wound with nonhemolytic streptococci and disruption of the wound. This could not be resutured because of the infection and was accordingly strapped together with adhesive tape, and a Miller-Abbott tube was immediately passed. This reached the lower part of the ileum in two days and prevented excess intraperitoneal pressure from causing recurrence of the evisceration. The wound healed by second intention.

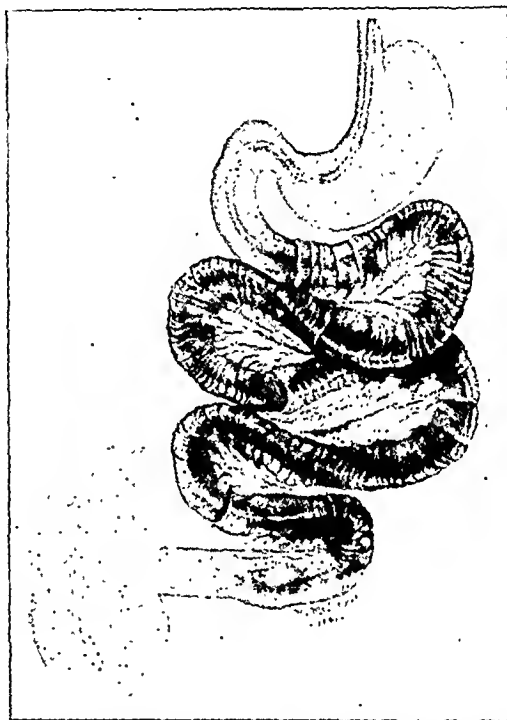


Fig. 1.—Collapsed bowel threaded on tube; these three or four coils of bowel can easily be manipulated with a minimum of trauma.

CASE 3.—A Jewish girl aged 17, a college student, entered the hospital on Jan. 23, 1940. Seven months previously she had had an appendectomy with an uneventful convalescence and complete health until nine days before this admission, at which time she began to have crampy abdominal pain, fever and vomiting. Physical examination revealed a tender mass in the right lower quadrant of the abdomen. An operation was performed on the day of admission and drainage of an abdominal abscess done. The patient improved but continued to have signs of persistent infection in the region of the cecum, and a fecal fistula developed. The presumptive diagnosis was regional ileitis. All conservative means to close this over a period of ten weeks having failed, ileotransverse colostomy was resorted to on April 6.

A Miller-Abbott tube was passed on April 3, and roentgen studies on April 5 showed the tip of the tube to be about 1 foot (30 cm.) from the cecum (fig. 2). Between it and the cecum was a constricted area of intestine communicating with the fistula. At operation a mass of adhesions was found in the region of the cecum with several loops of intestine entering it. One of these was confidently identified as the end of the ileum

From the Surgical Service of the Massachusetts General Hospital.

1. Abbott, W. O., and Johnston, C. G.: A Nonsurgical Method of Treating, Localizing and Diagnosing the Nature of Obstructive Lesions, *Surg., Gynec. & Obst.* 66: 691 (April) 1938. Leigh, O. C., Jr.; Nelson, J. A., and Swenson, P. C.: The Miller-Abbott Tube as an Adjunct to Surgery of Small Intestinal Obstruction, *Ann. Surg.* 111: 186 (Feb.) 1940. McKittrick, L. S., and Sarris, S. P.: Acute Mechanical Obstruction of the Small Bowel: Its Diagnosis and Treatment, *New England J. Med.* 222: 611 (April 11) 1940.

2. Boon, T. H.: Intubation of the Small Intestine: Demonstration and Localization of Partially Obstructive Lesions, *Lancet* 1: 7 (Jan. 6) 1940. Abbott and Johnston.¹

3. Ravdin, I. S., and Abbott, W. O.: The Use of the Miller-Abbott Tube in Facilitating One-Stage Resections of the Small and Large Bowel, *Internat. Clin.* 1: 178 (March) 1940.

4. Johnston, C. G.: Decompression in the Treatment of Intestinal Obstruction, *Surg., Gynec. & Obst.* 70: 365 (Feb., no 2A) 1940.

because of the presence of the tip of the tube within it. In the absence of the tube identification would have been impossible without extensive dissection into the infected area. Transection of the ileum and an ileotransverse colostomy were done on the identified loop. The tube was left down for five days after the operation. The patient had an uneventful convalescence, except for the development of an abscess beneath the scar left by her appendectomy, and all fecal drainage ceased. She was discharged in moderately good health on May 25 and returned to her home in another city. It was hoped that she might later become well enough to return for a colectomy on the right side. A few months later, however, it was reported to us that extension of her infection had developed with other complications and she had died.

COMMENT

The length of the human small intestine from the ligament of Treitz to the ileocecal valve, measured in situ in cadavers, averages 23 feet (700 cm.).⁵ The length in the living person is impossible to measure accurately because it is continually changing. We do know, however, that because of tonus it is shorter than it is at the autopsy table.⁶ The length of the mesenteric border is 13 feet 8 inches (420 cm.).⁵ Probably a working value would lie somewhere between these two,



Fig. 2.—Appearance after injection of barium sulfate through the tube: A, displaced, deformed cecum; B, length of constricted, diseased terminal ileum; C, tip of tube, which is shown by the injected barium to be about 1 foot (30 cm.) from the ileocecal valve.

perhaps 19 feet (580 cm.). Since the length of tube generally necessary to pass through this amount of intestine is 3 to 4 feet (90 to 120 cm.) the amount of wrinkling, reefing and even intussusception that must take place with resultant decrease in volume of the peritoneal contents is considerable (fig. 1). The value of this procedure in giving easy exposure within the abdomen or in preventing or treating the disruption of the wounds becomes obvious.

The use of the Miller-Abbott tube in the identification of loops of the small intestine which cannot be identified by the operator

because of adhesions is illustrated by case 3 and by several other cases in which we have given treatment. In order to be sure where the tip of the tube lies in relation to the cecum before operation a small amount of a weak suspension of barium may be injected through it and followed fluoroscopically until it enters the cecum (fig. 2). At laparotomy, then, the operator can identify the tip of the tube and know not only what part of the small intestine he is dealing with but also which direction from the part is upstream and which is downstream.

Cases in which the tube acts as a help in the manner indicated are not common, but when one has been encountered such help, in our experience, has been invaluable.

205 Beacon Street.

MASSIVE HEMORRHAGE IN BENIGN PROSTATIC ENLARGEMENT

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AND

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It is our purpose in this paper to reemphasize the fact that uncontrollable prostatic hemorrhage can and does occur in benign hypertrophy. We have reference not to the hematuria so often associated with prostatism but indeed to a massive hemorrhage which actually threatens the life of the patient. That such a situation may occur spontaneously is significant, and its appreciation bespeaks caution in the use of instruments on the urethras of persons with prostatism.

Adler¹ in 1892 reported the first case of uncontrollable prostatic hemorrhage due to ruptured prostatic varices following urethral catheterization. Shivers² in 1935 reviewed the existing literature, and since that time 9 additional cases have been reported by Nitsche³ and Hyman and Leiter,⁴ bringing the total number to 35. Hyman,⁵ since his article in 1938, has seen 2 additional cases, and we wish to report a case of our own.

ETIOLOGY

There are mentioned in the literature three primary causes of uncontrollable prostatic hemorrhage: (1) ruptured submucous varices of the hypertrophied prostate, (2) bleeding surface ulcerations of the gland and (3) generalized prostatic congestion with capillary bleeding.

Varices occur almost exclusively on the posterior commissure (median lobe). The formation of varices on this lobe was explained by Shivers. The veins emerge from the sides of the prostate and the posterior portion of the vesical outlet. The tonicity of the internal sphincter plus the pressure of the hypertrophied lateral lobes so impedes the venous return to the prostatic plexus that dilatation of the superficial veins results. These submucous vessels may rupture either spontaneously or through trauma.

Ulcerations may occur on the posterior commissure; however, their cause is often obscure. Infection might well be the most common cause, especially after instrumentation, though most authors have not discussed the degree or even the presence of infection. Lett⁶ reported a case in which a stone in the bladder was the initiating factor in prostatic ulceration. Even trophic factors might well play a part in the production of apparently spontaneous ulcers of the prostate.

From the Urological Service of Dr. Owsley Grant, University of Louisville School of Medicine and the Louisville City Hospital.

1. Adler, J. M.: A Fatal Prostatic Hemorrhage. *Berl. Klin. Wchnschr.*, 1892, pp. 542-543.

2. Shivers, C. H. DeT.: Uncontrollable Hemorrhage from Benign Prostatic Enlargement: Report of a Case. *J. Urol.* 34: 417-427 (Nov.) 1935.

3. Nitsche, P. H.: Uncontrollable Hemorrhage of Prostatic Enlargement. *Am. J. Surg.* 37: 109-111 (July) 1937.

4. Hyman, Abraham, and Leiter, H. E.: Uncontrollable Prostatic Hemorrhage. *J. Mount Sinai Hosp.* 5: 229-233 (Nov.-Dec.) 1938.

5. Hyman, Abraham: Personal communication to the authors.

6. Lett, Hugh: On Urinary Calculus, with Special Reference to Stone in Bladder. *Brit. J. Urol.* 8: 205-232 (Sept.) 1936.

5. Monks, G. H.: Studies on the Surgical Anatomy of the Small Intestine and Its Mesentery. *Ann. Surg.* 42: 543, 1905.

6. Van der Reis, V., and Schembra, F. W.: Lange und Lage des Verdauungsrohres beim Lebenden. *Ztschr. f. d. ges. exper. Med.* 43: 94, 1924.

Generalized capillary bleeding may well be a secondary manifestation of Nitsche's factor of hypertension. Most physicians have seen a similar condition following transurethral prostatectomy done under spinal anesthesia. After the patient is returned to bed there develops from the surface of the freshly resected prostate a generalized venous oozing due to the gradually increasing blood pressure. Hence it is not hard to imagine that an analogous situation might occur in an enlarged congested prostate associated with considerable variable hypertension.

The actual cause of bleeding was given in only 16 of the 35 cases reported in the literature. In 6 cases, or 17.1 per cent, the bleeding was considered due to ruptured prostatic varices. In 3, or 8.5 per cent, it was due to ulcerations of the gland. Capillary oozing was considered the etiologic agent in 6 instances, or 17.1 per cent. In 1 instance an arteriosclerotic vessel was found at fault when the patient came to necropsy (Hyman and Leiter⁴).

In 9 cases, or 25.7 per cent, hemorrhage followed urethral instrumentation, and on 3 occasions, or 8.5 per cent, the hemorrhage followed suprapubic cystotomy and might well have been due to the trauma induced by the suprapubic catheter.

With the foregoing observations and facts in mind one may easily see why massive prostatic hemorrhage might occur, and its infrequency is indeed surprising. In fact, Shivers mentioned that he personally had been informed by men of wide urologic experience that they had never seen such a case. We have made an identical observation.

MANAGEMENT

In the treatment of patients with massive prostatic hemorrhage there are certain principles that must be observed. The use of a prostatic bag is undesirable as an agent for effecting hemostasis, since, if adequate tension is exerted on a bag to occlude the bleeding vessel, which may be concealed in a crevice created by the hypertrophied lobes of the prostate, there may be sufficient pressure to initiate separation of the prostatic lobes and thus enhance bleeding. Similarly, extremely tight intra-urethral packs can easily cause a mechanical separation of the prostatic lobes when the pack becomes soaked with blood and urine and expands. Hyman used in 1 case a thromboplastin-soaked pack to facilitate hemostasis.

Sutures must be used with extreme care and are practicable only when adequate exposure is possible. Tension cannot be exerted on sutures, since the adenomatous tissue is most friable, and if a suture pulls out additional bleeding will occur from the lacerated gland.

If the bleeding point is localized in an area of ulceration the cautery or coagulation electrode of the endotherm will often suffice. However, if there is bleeding from huge lacerated or ruptured varices or a generalized capillary hemorrhage, prostatic enucleation may be the only recourse.

Primary prostatic enucleation was undertaken 19 times, or 51.3 per cent, in all 37 cases (including the 2 additional cases of Hyman). Suprapubic cystotomy was found adequate to control hemorrhage in 8, or 21.6 per cent, of the cases in which operation was done. It is essential that the patient with massive hemorrhage of prostatic origin be treated actively. The fact that the patient is in general a poor risk is no contraindication for primary prostatic enucleation in the face of continued profound hemorrhage.

REPORT OF CASE

A white man aged 67 was admitted for acute urinary retention due to prostatism. The patient had had symptoms of prostatic enlargement for several months previously but had no other complaints. The blood pressure was 140 systolic and 70 diastolic, and no significant physical abnormalities presented themselves other than nonmalignant enlargement of the prostate, discovered by digital examination. Laboratory work showed no pathologic condition on microscopic, chemical or serologic investigations of the patient's blood and urine.

Cystoscopy was undertaken (by Dr. Lich), and, although the cystoscope was passed without effort, no visualization of

either the bladder or the urethra was possible. When the telescope was removed there appeared a continuous flow of bright red clots and fresh blood. Visualization was again attempted, but without success. It was evident that a profound vesical hemorrhage had been initiated, and immediate surgical intervention was imperative.

Cystotomy was performed (by Dr. Pierce), and on the greatly enlarged posterior commissure there were found three huge submucous varices, the central one of which had ruptured and was actively bleeding. There was present also a submucous hematoma which extended over the entire superior surface of the posterior commissure. The hemorrhage was instantly controlled by using a proximally placed figure of eight suture to constrict the bleeding vessel. A lightly packed gauze tamponade was left in the posterior part of the urethra further to aid hemostasis. The patient enjoyed an uneventful course after both this procedure and the subsequent suprapubic prostatectomy.

SUMMARY

1. Massive prostatic hemorrhage, though rare, is a grave problem which must be handled with heroic surgical measures.

2. Ruptured varices and ulcerations, along with generalized capillary bleeding, constitute the chief etiologic factors in massive prostatic hemorrhage.

3. The case reported brings the total number in the literature to 38.

323 East Chestnut Street.

DEATH FROM PULMONARY EMBOLISM FOLLOWING THE INJECTION OF VARICOSE VEINS

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If one considers the many cases in which varicose veins are treated by the injection of sclerosing solutions, the dreaded complication of pulmonary embolism is relatively uncommon. Pennoyer¹ in 1930 stated that only 4 cases had been reported up to that time; he stated further that in all these cases injection may have been done in the presence of acute or subacute phlebitis. Since 1930 2 more cases have been reported in this country and several have appeared in the foreign literature. Since 400,000 cases had been reported in which injection had been done, the possibilities of such a complication seem to be almost nil.

In 1928 McPheeters and Rice² reported 7 deaths in a series of 53,000 cases of injection therapy; Kettel³ reported 20 deaths in a series of 60,000 cases, mortalities of 0.0025 per cent and 0.033 per cent respectively. These figures represent the combined mortality and include embolic accidents plus the various other causative factors of death.

Such low mortality figures may be due to the fact that this procedure carries practically no risk or that serious complications following injection therapy are overlooked or not reported. Kilbourne⁴ has stated that "major complications following injection treatment of varicose veins are occurring with such frequency that the call of the voice of warning is imperative. It is unfortunate that such cases are concealed or divulged under the cloak of confidence. These accidents are preventable!"

Taylor⁵ expressed the belief that the injection treatment is sufficiently hazardous to warrant ligation high in the saphenous vein prior to injection. In view of the extremely low mortality mentioned, such a measure seems a bit reactionary.

1. Pennoyer, G.: The Injection Treatment of Varicose Veins, *Ann. Surg.* 91: 416 (March) 1930.

2. McPheeters, H. O., and Rice, C. O.: Varicose Veins: Complications, Direct and Associated, Following the Injection Treatment: A Review of the Literature, *J. A. M. A.* 91: 1090 (Oct. 13) 1928.

3. Kettel, K.: Ueber Todesfälle im Anschluss an die Injektionsbehandlung von Varicen. Eine Literaturübersicht, *Zentralbl. f. Chir.* 58: 1498 (June 13) 1931.

4. Kilbourne, N. J.: Varicose Veins: Indications and Contraindications to Injections, *Ann. Surg.* 93: 691 (March) 1931.

5. Taylor, K. P. A.: Pulmonary Emboli Following the Injection of Varicose Veins, *Am. J. Surg.* 45: 145 (July) 1932.

Smith⁶ in reviewing a series of cases at the Mayo Clinic expressed the belief that emboli occur more frequently than the reported cases indicate. In 1939 in a series of 5,370 cases involving treatment by injection, he was able to demonstrate roentgenologically and clinically eight pulmonary infarctions, none of which proved fatal. Conditions which increase the hazard of pulmonary infarction in the injection treatment of varicosities are (1) acute or subacute phlebitis, (2) distal, concealed foci of infection, (3) senility and (4) the use of solutions which produce coagulation.

In the case we are reporting death occurred in the absence of any of the foregoing contraindications. An embolic accident followed the injection of an uncomplicated, asymptomatic, small varicose vein, the injection being done for purely cosmetic reasons. Autopsy confirmed the clinical impression of events leading to the patient's death.

REPORT OF CASE

Mrs. E. C., a housewife aged 41, entered St. Joseph's Hospital on Aug. 16, 1940 because of collapse, pain in the chest, cough and bloody sputum. Three days prior to entry she had been perfectly well and had been vacationing in the mountains. On August 14, two days prior to entry, the patient experienced a sense of malaise and chill which she attributed to a chilling received while swimming; the symptoms at that time were minimal, however, and after retiring she was quite comfortable until the morning of the following day, at which time she experienced a sudden stabbing pain in the right side of the chest anteriorly which radiated through to the back. The pain was aggravated by deep inspiration and by a nonproductive cough which developed shortly after the onset of the pain.

In spite of the discomfort associated with the cough, the patient remained up, walking about the camp at which she was staying; the pain and cough were somewhat less distressing toward evening. She was comfortable and able to rest that night. The following morning there was an exacerbation of symptoms, the pain was excruciating, the cough became productive of blood-tinged sputum and the patient became acutely ill. She was brought to the hospital from the camp in an automobile, a distance of 60 miles.

The previous history was essentially negative; there were no symptoms attributable to heart disease or pathologic conditions of the pelvis. Six weeks prior to the present illness, the patient had had an isolated saccular varicose vein in the right leg injected elsewhere. At the time of this injection the physician stated that there was no evidence of recent or old phlebitis. She received two injections of 2 cc. of a 5 per cent solution of sodium morrhuate with an interval of six days between injections. There was no decided reaction after this treatment, and a satisfactory thrombosis followed.

On physical examination the patient was acutely ill, pale and perspiring. She was coughing intermittently while lying flaccidly in bed and had pain in the right side of the chest. The skin was gray and clammy, there was no appreciable adenopathy, the eyes reacted properly and the ears, nose and throat were apparently normal. On entry the respiratory rate was 32; the respiratory movements were shallow and apparently equal on the two sides. There was diminution of resonance over the base of the right lung posteriorly, and the breath sounds were diminished anteriorly over the middle lobe of the right lung. The cardiac sounds were rapid and of fair quality; the pulse rate was 100, regular but of poor quality. The blood pressure on entry was 96 systolic and 60 diastolic. The abdomen was soft and relaxed, with no guarding or tenderness. There was an 8 by 3 cm. indurated area surrounding a thrombosed segment of the greater saphenous vein on the medial aspect of the right calf.

Laboratory data were as follows: The blood showed hemoglobin 122 per cent, erythrocytes 5,650,000 and leukocytes 26,600. The differential count of leukocytes showed polymorphonuclear neutrophils 81 per cent, small lymphocytes 15 per cent, large lymphocytes 1 per cent and monocytes 3 per cent. The sedi-

mentation rate was within normal limits, the urine showed no sugar or albumin and microscopic examination gave negative results. The Kahn reaction was negative.

The clinical course was rapid; shortly after entry the blood pressure fell, the patient became semicomatose and, in spite of shock therapy and the administration of oxygen and large doses of opiates she became progressively worse and died twenty-four hours after entry. The clinical diagnosis was (1) chemical phlebitis of the right saphenous vein and (2) pulmonary embolism and infarction.

Autopsy was performed eight hours after death; the principal changes noted were as follows:

The right pleural cavity was free of adhesions and contained 500 cc. of clear, blood-tinged fluid; the right lung weighed 700 Gm. and the pulmonary tissue was well aerated except for a consolidated, red and hemorrhagic area 9 by 4 by 4 cm. extending out from the hilus. This infarcted area did not extend to the periphery of the lung, the pleural surface not being involved.

The pulmonary artery was opened in situ and a probe passed along the vessel until an obstruction was encountered. The heart and lungs were then removed *en masse* and the pulmonary artery and its branches opened. At the point of division of the right pulmonary artery into its main branches an embolus was seen; this was the site of obstruction encountered when the probe was inserted along the course of the vessel. The embolus occluded the lower of the two main branches of the right pulmonary artery and extended along the vessel for a



Appearance of a section of the saphenous vein showing the portion of the clot from which the embolus was released.

distance of 5 cm. The embolus was dry and friable and adherent to the intima of the vessel; when it was removed some resistance was encountered and the intima at the site of attachment was roughened and covered with a thin layer of fibrin.

Over the medial surface of the left calf a thickened, indurated 11 cm. segment of the great saphenous vein was palpated. This section was dissected free and opened with some difficulty, as the walls were thickened and cut with abnormal resistance. The lumen of the vein was found to be narrowed but not completely occluded. The lumen of the vein transversing this segment was of varying caliber, the distal calf being narrowed almost to the point of occluding the vessel. At the midpoint of the segment a tributary vein joined the saphenous; above this the vessel was of much larger caliber. There was a thrombus occupying the distal portion of this dilated segment; the proximal end of the thrombus was ragged and frayed. The thrombus was stripped from the wall of the vein without difficulty.

Histologic examination of the thrombus taken from the saphenous vein showed it to be formed largely of platelets and fibrin; there were relatively few red cells. The embolus removed from the pulmonary artery consisted of fused platelets and fibrin and many red cells.

The pathologic diagnosis was (1) pulmonary embolism and infarction and (2) chemical phlebitis of the right great saphenous vein.

SUMMARY

Pulmonary embolism followed the injection of a small varicose vein of the leg, done solely for cosmetic reasons.

In a review of the literature on this subject it was found that following 110,000 injections the mortality rate was 0.0177 per cent. This figure represents all causative factors of death, including embolic accidents.

The incidence of embolism following the injection of ordinary varices in the leg is extremely small. However, we believe that it is of sufficient importance for the phenomenon to warrant attention.

301 East Tenth Street.

6. Smith, F. L.: Varicose Veins: Complications and Results of Treatment of Five Hundred Patients. *Mil. Surgeon* 85:514 (Dec.) 1939.

Special Article

GLANDULAR PHYSIOLOGY AND THERAPY

THE PHYSIOLOGY OF THE THYROID GLAND

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This special article is published under the auspices of the Council on Pharmacy and Chemistry. It is one of a series which will be published in book form as the second edition of "Glandular Physiology and Therapy." The opinions expressed in this article are those of the author and do not necessarily represent the views of the Council.—Ed.

The thyroid is a gland of internal secretion whose chief function, so far as is known, is the elaboration and storage of its own peculiar hormone, namely, thyroglobulin, or the amino acid thyroxin contained therein. Originally it was a gland taking part in digestion. In the course of evolutionary changes, it has lost its connection with the alimentary tract. As Means¹ aptly said, "For a rôle in digestion it has substituted a rôle in growth and metabolism." To fulfil these functions, it is endowed with tremendous capacities for increasing or decreasing its activities, manifested by changes in size, blood supply, microscopic appearance and hormone content. In man the thyroid attains its relative maximum size just prior to puberty, corresponding to the time of maximum load on the organ from factors of growth and development. Simple colloid goiter, so common at this age, is the clinical manifestation of this physiologic fact.

HISTOPHYSIOLOGY OF THE THYROID

The gland is composed of a number of so-called follicles or acini, each one of which is a secretory unit. The average diameter, according to Wilson,² is 300 microns, but according to Jackson³ it is somewhat smaller. The wall of the follicle consists of epithelium one cell deep. In normal glands the cell is about as high as it is wide (about 15 microns). The height of the epithelium has become a useful index of the functional activity of the thyroid.⁴ The epithelium becomes flat when thyroid function is diminished and columnar when thyroid function is increased.

The cells of the follicle make the thyroid colloid; the lumen is the storehouse. The body taps this stored secretion as needed. Such a mechanism is obviously adapted to cope with great functional variations. The essential component of the follicle is the thyroid cell, which is fundamentally a secretory cell. Close study of this cell reveals certain characteristics, in addition to height, which betray its state of activity.

The importance of the mitochondria in relation to the functional activity of the cell was first noted by

Goetsch.⁵ Numerous experimenters have confirmed this. Cramer and Ludford⁶ showed that as the cell passes from an inactive to a very active phase there occur heightening of the cell, diminution of colloid in the follicle and increase in the number and size of the mitochondria.

The Golgi apparatus is another cytoplasmic structure of physiologic significance. In the salamander Uhlenhuth⁷ correlated the state of the Golgi apparatus to the secretory phases of the cell. In the guinea pig Krogh and Okkels⁸ observed the changes after an injection of a thyrotropic extract of the anterior lobe of the pituitary. There occur, after two hours, hyperemia of the whole gland, diminution in the size of the follicles, disappearance of colloid and great hypertrophy of the Golgi apparatus. This is maintained for about seven-teen hours. These histologic changes are paralleled by an increase in metabolic rate. Similar cytologic changes were observed by Severinghaus⁹ in the thyroids of other species. The latter also noted that colloid droplets first appear in close proximity to the enlarged Golgi apparatus.

Oxidase granules were described by Okkels,¹⁰ who related their distribution to thyroid function. In normal animals they are chiefly in the base of the cells. After injection of a thyrotropic extract they increase in numbers in the cells, invade the colloid and later become numerous in the interfollicular spaces as the colloid becomes vacuolated.

There is only one kind of cell in the follicle. It presents different appearances because it is observed in different stages of secretory activity. Recently Nonidez¹¹ described "parafollicular" cells, derived from parenchymal cells but occupying a position independent of the follicles. He suggested two possible functions for these cells: Either they represent a second type of secretory cell or they absorb something from the intra-follicular colloid and deliver it into the perifollicular blood vessels.

A good deal of controversy exists as to the direction in which the thyroid cells secrete—into the follicle or into the circulation. Means,¹ after going over the evidence thoroughly, favored the view that secretion can be in either direction. "Very likely, direct secretion into vessels occurs only when, in the face of great demand, the follicular storehouse has been emptied." Recently Algire,¹² employing a special method of trans-illuminating the thyroid gland of the living salamander, observed that, following injections of a thyrotropic anterior pituitary substance, there occur, in sequence, the gradual enlargement of a granule into a colloid droplet, the formation of new colloid droplets in proximity to the apical end of the nucleus, and the move-

5. Goetsch, E.: Functional Significance of Mitochondria in Toxic Thyroid Adenomata, *Bull. Johns Hopkins Hosp.* 27: 129 (May) 1916.

6. Cramer, W., and Ludford, R. J.: Cellular Activity and Cellular Structure as Studied in the Thyroid Gland, *J. Physiol.* 61: 398 (June) 1926.

7. Uhlenhuth, Eduard: The Golgi Apparatus in the Thyroid Gland of Amphibians, in Its Relation to Excretion Polarity, *Quart. J. Micro. Sc.* 76: 615, 1934.

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9. Severinghaus, Aura E.: Cytological Observations on Secretion in Normal and Activated Thyroids, *Ztschr. f. Zellforsch. u. mikr. Anat.* 19: 653, 1933.

10. Okkels, Harald: Stades initiaux de la sécrétion thyroïdienne. Les granulations oxydasiques, *Compt. rend. Soc. de biol.* 116: 251 (May) 1934.

11. Nonidez, J. F.: Further Observations on Parafollicular Cells of Mammalian Thyroid, *Anat. Rec.* 53: 339 (Aug.) 1932.

12. Algire, G. H.: The Study of the Living Thyroid Gland, *Bull. School Med., Univ. Maryland* 23: 211 (April) 1939.

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1. Means, J. H.: *The Thyroid and Its Diseases*, Philadelphia, J. B. Lippincott Company, 1937.

2. Wilson, G. E.: The Thyroid Follicle in Man: Its Normal and Pathological Configuration, *Anat. Rec.* 37: 31 (Nov.) 1927.

3. Jackson, J. L.: The Shape and Size of the Human Thyroid Follicle in Health and Disease, *Anat. Rec.* 48: 219 (Feb.) 1931.

4. Rawson, R. W., and Starr, Paul: Direct Measurement of Height of Thyroid Epithelium: Method of Assay of Thyrotropic Substance; Clinical Application, *Arch. Int. Med.* 61: 726 (May) 1938.

ment of colloid droplets from the apical end of the cell to the basal position, presumably for direct secretion into the vessels.

How the stored colloid gets into the circulation is also a moot question. It has been suggested¹³ that it passes through intercellular channels. This view was opposed by Severinghaus,⁹ who expressed the belief that the apexes of the cells push into the colloid in a pseudopodial-like manner, for the purpose of absorbing it. The colloid is then actively passed through the cells to the perifollicular vessels. The suggestion by Hertz¹⁴ that endothelial leukocytes transport colloid from the follicle into the interfollicular spaces affords another explanation. The parafollicular cells of Nonidez, as indicated in a foregoing paragraph, may be engaged in a similar function. Recently Williams,¹⁵ observing living thyroid follicles implanted in rabbits' ears, found that all follicles go through repeated cycles of activity. These cycles are divided into four stages—secretion, secretion and colloid release, partial collapse and recuperation. Secretion is toward the lumen. He found no evidence of active secretion across the base of the cell. In the second stage, when the follicle is filled with colloid, a droplet is pinched off and comes to lie within the follicular wall. The droplet slowly disappears, presumably by diffusion across the thin wall, but is never extruded into the interfollicular spaces. In other follicles a whole section of wall may become thin and colloid diffuse across it. No vacuoles are seen at the periphery of the colloid.

Since diffusion of a large molecule like thyroglobulin across a living semipermeable membrane is not likely, the presumption is that thyroglobulin is probably first digested (enzymatically) and that the resultant small fragments then diffuse through the follicle wall. This mechanism suggested by Williams, in contrast to the others, is consistent with my own observation¹⁶ that thyroglobulin is not detectable in the peripheral blood or the blood of the thyroid vein of the normal person or of the patient with thyroid disease.

BLOOD SUPPLY AND INNERVATION OF THE THYROID

The blood supply of the thyroid is abundant. The blood volume of normal man (about 5 liters) moves through his thyroid about once an hour. There is a rich capillary network intimately connected with the parenchymal cells. Modell¹⁷ recently described arteriovenous anastomoses and so-called "muscle cushions" in the thyroids of dogs. Williams,¹⁵ on the other hand, was unable to see such structures in the living tissue. Their function is undoubtedly to regulate the flow of blood to the follicles and thus control the delivery of secretion to the body.

There is also a lymph plexus in close proximity to the follicles. A small portion of the thyroid's secretion leaves by this channel.

The thyroid is supplied by a rich network of autonomic nerve fibers, sympathetic from the cervical ganglions and parasympathetic from the vagus. It is still debated whether these fibers are secretory or vasomotor. The weight of evidence favors the view that they are not secretory and that secretory activity of the thyroid is governed indirectly by vasomotor control (Nonidez;¹⁸ Cahane and Cahane;¹⁹ Uotila²⁰). On the other hand, there is good evidence that secretory activity of the pituitary can be influenced directly through nerve channels (Thomson and Collip;²¹ Friedgood and Pincus²²). This has been confused with direct nervous control of thyroid secretion. There is also evidence that the hypothalamohypophysial pathways may control thyroid function by their influence over the pituitary. Uotila²³ recently demonstrated that under normal circumstances section of the pituitary stalk does not affect the thyrotropic function; the thyroid consequently remains normal. However, under certain stresses, such as exposure to cold, animals in which the pituitary stalk has been sectioned fail to display the expected hypertrophic changes in the thyroid.

THYROID HORMONE

One of the outstanding peculiarities of the thyroid is that it contains iodine in organic combination, a fact discovered by Baumann in 1896. The normal human thyroid contains about 0.186 per cent of iodine in terms of dried gland, the variation being 0.05 to 0.45 per cent (Gutman, Benedict, Baxter and Palmer²⁴). Of the total iodine store in the body, the thyroid possesses about one third to one fourth. Seidell and Fenger²⁵ demonstrated a seasonal variation in the storage of iodine—lower in the early spring and higher in the late summer. Locality and food habits also play a role in determining the iodine content of the thyroid. Fenger²⁶ found iodine in fetal thyroids as early as the third month. It was demonstrated by Marine and Lenhart²⁷ that the iodine store varies inversely with the degree of hyperplasia.

Other structures of the body contain iodine, but the thyroid differs from them in its affinity for this element. It rapidly traps any extra iodine entering the circulation up to its maximum capacity, the amount trapped depending on the degree of thyroid activity (hormone depletion). This fact is the basis of the so-called iodine tolerance test in hyperthyroidism, introduced by

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14. Hertz, Saul, cited by Means.¹
15. Williams, R. G.: Microscopic Studies of Living Thyroid Follicles Implanted in Transparent Chambers Installed in the Rabbit's Ear, Am. J. Anat. 62: 1 (Nov.) 1937.

16. Lerman, Jacob: Iodine Components of the Blood: Circulating Thyroglobulin in Normal Persons and in Persons with Thyroid Disease, J. Clin. Investigation 19: 555 (July) 1940.

17. Modell, Walter: Observations on the Structure of the Blood Vessels Within the Thyroid Gland of the Dog, Anat. Rec. 55: 251 (Feb. 25) 1933.

18. Nonidez, J. F.: Innervation of the Thyroid Gland: III. Distribution and Termination of the Nerve Fibers in the Dog, Am. J. Anat. 67: 135 (July) 1935; Nervous "Terminal Reticulum": Critique; Observations on Thyroid and Liver, Anat. Anz. 84: 1 (March) 1937.

19. Cahane, Mares, and Cahane, Tatiana: Sur l'existence des centres nerveux infundibulaires réglant la fonction du corps thyroïde, Acta med. Scandinav. 94: 320, 1938.

20. Uotila, U. U.: Role of Cervical Sympathetics in the Regulation of Thyroid and Thyrotropic Function, Endocrinology 26: 63 (July) 1939.

21. Thomson, D. L., and Collip, J. B.: The Hormones, in Luck, J. M.: Annual Review of Biochemistry, Stanford University, Calif., Stanford University Press, 1933, vol. 2, p. 231.

22. Friedgood, H. B., and Pincus, Gregory: Studies on Conditions of Activity in Endocrine Organs: XXX. The Nervous Control of the Anterior Hypophysis as Indicated by Maturation of Ova and Ovulation After Stimulation of Cervical Sympathetics, Endocrinology 10: 710 (Nov.-Dec.) 1935.

23. Uotila, U. U.: On the Role of the Pituitary Stalk in the Regulation of the Anterior Pituitary, with Special Reference to the Thyrotropic Hormone, Endocrinology 25: 605 (Oct.) 1939.

24. Gutman, A. B.; Benedict, Ethel M.; Baxter, Blanch, and Palmer, W. W.: The Effect of Administration of Iodine on the Total Iodine, Inorganic Iodine, and Thyroxine Content of the Pathological Thyroid Gland, J. Biol. Chem. 97: 303 (July) 1932.

25. Seidell, A., and Fenger, F.: Seasonal Variation in the Iodine Content of the Thyroid Gland, J. Biol. Chem. 13: 517, 1913.

26. Fenger, F.: On the Iodine and Phosphorus Contents, Size and Physiological Activity of the Fetal Thyroid Gland, J. Biol. Chem. 14: 397, 1913.

27. Marine, David, and Lenhart, C. II.: Further Observations on the Relation of Iodine to the Structure of the Thyroid Gland in the Sheep, Dog, Hog and Ox, Arch. Int. Med. 3: 66 (Feb.) 1907.

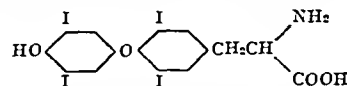
Elmer.²⁸ Thyroid has the same affinity for iodine *in vitro* as *in vivo* (Marine and Feiss;²⁹ Rabinowitch and Frith³⁰). Using radioactive iodine, Hertz, Roberts, Means and Evans³¹ found that the normal rabbit's thyroid takes up iodine rapidly and becomes saturated within ten to fifteen minutes after an intravenous injection of iodine. Furthermore, certain types of hyperplastic glands are less able to utilize small amounts of iodine than are normal glands, although their capacity for taking up iodine from large doses is several times that of the normal gland. This may explain the need for relatively large amounts of iodine to induce a remission in the syndrome of exophthalmic goiter.

Preceding Baumann's discovery, it became apparent that the thyroid made a hormone. The syndrome associated with spontaneous atrophy of the thyroid, described by Gull³² in 1874, was soon recognized as identical with the one due to total removal of the thyroid as noted by the Reverdins³³ in 1882 and by Kocher³⁴ in 1883. Knowledge of the curative value of thyroid substitution soon followed. In 1891 Murray³⁵ cured patients with hypothyroidism by subcutaneous injection of sheep's thyroid, and in 1892 Mackenzie³⁶ and also Fox³⁷ found that oral administration was equally effective.

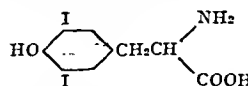
Attempts at chemical isolation of the thyroid principle began with the discovery by Oswald³⁸ and by Hutchison³⁹ that the iodine of the thyroid is bound to a globulin (iodothyroglobulin) which is physiologically active and equal to whole thyroid. Other proteins of the thyroid do not contain iodine and are physiologically inert. It is the only protein present in colloid; it is also present in the follicle cells. The molecular weight of thyroglobulin was determined by Heidelberger and Svedberg⁴⁰ to be in the neighborhood of 700,000.

The early attempts at chemical purification of the colloid brought only partial success. Among others, Baumann, Müller and also Oswald obtained fractions of high iodine content and high physiologic potency by acid hydrolysis. In 1915 Kendall⁴¹ isolated a pure crystalline substance containing 65 per cent iodine and possessing all the pharmacologic characteristics of whole thyroid. He named it "thyroxine." Harington⁴² in 1926

demonstrated that Kendall's substance is an amino acid containing four iodine atoms—a hydroxyphenyl ether of tyrosine having the structural formula:



A year later Harington and Barger⁴³ synthesized thyroxine by conjugating two molecules of diiodotyrosine. The latter compound was isolated in pure chemical form from thyroid colloid by Harington and Randall.⁴⁴ It has the structural formula:



These two iodine-containing amino acids are the only ones, so far as present knowledge goes, to be found in the thyroid. Of the total iodine present in normal thyroid, about 30 per cent is in the form of thyroxine and about 70 per cent in the form of diiodotyrosine.

PHYSIOLOGIC POTENCY

What determines the physiologic potency of whole thyroid gland and how it is related to that of pure thyroxine are matters of physiologic interest. They are also of practical importance from the point of view of standardization of thyroid preparations. Several methods for measuring physiologic potency are available, for example, the Gudernatsch tadpole test and the Hunt acetonitrile test. However, the most convenient and most precise method of assaying thyroid for physiologic potency is by observing the effect on the rate of gaseous metabolism. In the past ten years my co-workers and I have assayed many and a variety of preparations, using as the index of activity the rate of increase of the basal metabolism of patients with full blown myxedema, from their low level, when the material is administered in daily doses for approximately two weeks. The basis for this technic has been discussed extensively by Means.¹

Following the work of Kendall and of Harington on the isolation and nature of thyroxine, it was believed that thyroxine was the only active substance contained in thyroid and that measurement of the activity of a thyroid preparation could be obtained by measuring its thyroxine content. In other words, the calorogenic potency of a thyroid preparation could be better ascertained from its thyroxine content than from its total iodine content. Direct comparison between thyroxine and whole thyroid is impossible, because the former is absorbed irregularly from the gastrointestinal tract and the latter cannot be given parenterally. This difficulty was solved when Harington and Salter⁴⁵ isolated a polypeptide of thyroxine containing 50 per cent iodine, which Salter, Lerman and Means⁴⁶ found to be equally active whether given by mouth or intravenously. These investigators then found that thyroxine and the polypeptide of thyroxine are physiologically equal on the basis of their iodine content. On the other hand, the activity of whole thyroid containing a standard amount of thyroxine iodine is much greater than that of thyroxine

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46. Salter, W. T.; Lerman, Jacob, and Means, J. H.: The Calorogenic Action of Thyroxine Polypeptide, *J. Clin. Investigation* **12**: 327 (March) 1933.

polypeptide containing the same standard amount of thyroxine iodine (Means, Lerman and Salter⁴⁷). Whole thyroid containing total organic iodine equal to standard thyroxine iodine gives a standard response. Moreover, Lerman and Salter,⁴⁸ observing the maintenance requirements of myxedematous patients on several brands of thyroid which contained different amounts of total iodine and of thyroxine iodine, concluded that total organic iodine, rather than thyroxine iodine, determines the calorogenic activity of whole thyroid.

Palmer and Leland,⁴⁹ however, using intact guinea pigs as test objects, came to the conclusion that thyroxine iodine, rather than total organic iodine, determines physiologic potency. Krogh and Lindberg,⁵⁰ using the same kind of test animal, came to similar conclusions. On the other hand, Meyer and Wertz,⁵¹ using thyroidectomized rats, and White and collaborators,⁵² using intact guinea pigs, have supported the contentions of Means, Lerman and Salter. In the past few years I have been comparing the effects of whole thyroid and thyroxine in normal and in thyroidectomized rabbits.⁵³ The results thus far emphasize the difficulty of using herbivorous animals in testing the effect of thyroid by mouth. In some instances the calorogenic response to thyroid by mouth equals that to thyroxine given intravenously in equi-iodine dosage; in others the calorogenic response to thyroid by mouth is much lower. These discrepancies are understandable when one realizes that stasis of food in the rabbit's stomach, frequently lasting eighteen to thirty-six hours, may result in destruction of ingested thyroglobulin.

The results obtained by Means and co-workers led to a puzzling paradox. The organic iodine of the thyroid is divided between thyroxine and diiodotyrosine. When separated, the latter is inert. Yet the activity of the whole thyroglobulin molecule is apparently due to all its iodine. It was suggested by Harington and Salter⁴⁵ that the high activity of whole thyroid iodine as compared with the thyroxine derived from it is due to such factors as chemical combination (peptide linkage) or optical activity of thyroxine. However, the polypeptide of thyroxine is not more potent than crystalline thyroxine in terms of iodine (Salter, Lerman and Means⁴⁶), and l-thyroxine, which occurs naturally in thyroglobulin, is no more active than d-thyroxine (Salter, Lerman and Means⁴⁴).

The synthesis of an active protein from the inert diiodotyrosine peptone by Salter and Lerman⁵⁵ may explain this paradox on the basis of Harington's theoretic concepts. According to Harington,⁵⁶ there is a special linkage in the thyroglobulin molecule between

thyroxine and diiodotyrosine which is ruptured in the initial stage of isolation of thyroxine. He has visualized this linkage as follows: "It may be supposed that the iodine which reaches the thyroid is first introduced into the molecule of tyrosine to form 3,5-diiodotyrosine. The latter will then fulfil a dual role; part of it will be converted into thyroxine . . . and another part will be linked with the thyroxine so formed, together with other amino-acids, to form the true active principle of the gland."

PHYSIOLOGY OF THYROID HORMONE

Knowledge of the physiologic action of thyroid has been obtained by four different methods. The first method consists in observing the effects produced by destruction of the gland—by disease or by surgical ablation—in the experimental animal and in man. The second method consists in observing the effect of feeding the gland to subjects deprived of it. The third method consists in observing the effects of an excess of active substance, spontaneous or induced. The final method, and the most recent, consists in observing the effect on the thyroid of removal of other glands or of administration of other glands. Without a doubt, the thyroid hormone plays a vital role in the economy of the body. Its various functions are to be considered under several headings, but it must be emphasized that they are undoubtedly all interrelated.

Calorogenic Action.—Magnus-Levy first recognized that the thyroid plays a role in the regulation of heat production, or, its equivalent, oxygen consumption and carbon dioxide production. In other words, the rate of energy exchange, or metabolism, is regulated by the thyroid. This calorogenic action is most conveniently measured by determining the consumption of oxygen over a period of time. When the organism is deprived of all thyroid, the metabolism drops to about 40 to 45 per cent below normal in about 60 to 80 days. The rate of decline is predictable. It may be represented by the exponential equation $y = C + Ae^{-kt}$ which describes a decay curve.⁵⁷ When thyroid or thyroxine is administered, the metabolism rises, the rate of increase and level attained depending on the dosage used. In general the response to thyroid is inversely proportional to the initial level of metabolism—it is greater at low levels than at high levels for any given dose. At high environmental temperatures and humidity the effect of thyroxine is exaggerated (Schmidt and Schmidt⁵⁸).

The means by which thyroid accelerates oxidative processes is not absolutely certain. It is not to be explained by increased muscular activity and is independent of adrenal activity (Aub, Bright and Uridil⁵⁹). It involves every tissue of the body. Ample proof is available that the metabolism of tissue excised from thyroidectomized animals is low, and that of tissue excised from hyperthyroid animals, high. The experiments of Meyer, McTiernan and Aub⁶⁰ indicate that the calorogenic action is independent of the nervous system, since tissues denervated prior to administra-

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59. Aub, J. C.; Bright, E. M., and Uridil, J.: Studies upon the Mechanism of the Increased Metabolism in Hyperthyroidism, *Am. J. Physiol.* 61: 300 (July) 1922.

60. Meyer, O. O.; McTiernan, C., and Aub, J. C.: The Effect of Thyroxine upon the Metabolism of Isolated Normal and Malignant Tissue, *J. Clin. Investigation* 12: 723 (July) 1933.

tion of thyroid show elevated metabolism just as do tissues left intact. Moreover, it is not necessary that the animal be intact for the hormone to exert its characteristic effect. Canzanelli and Rapport⁶¹ reviewed the results published on the effect of thyroid in vitro and reported that although thyroxine does not alter the oxygen consumption of tissues in vitro, thyroglobulin increases their metabolism considerably. The effect of diiodothyronine is inconstant and that of thyronine and that of diiodotyrosine negligible.

In its action the hormone, according to Zondek,⁶² is in the nature of a catalyst, exerting its effect directly on the cell. Its action differs from that of an enzyme, which can accelerate reactions in an unorganized system. The hormone, to exert its effect, requires a living intact cell. On the other hand, Dye⁶³ concluded that an excess or a scarcity of thyroxine leads to an increase or a decrease in the amount, potency and effectiveness of the respiratory catalysts of cells, rather than that the thyroid hormone acts as an independent catalyst of itself. Such a role is also suggested by the observation of Scharles, Robb and Salter⁶⁴ that thyroxine produces a marked increase of liver amylase in the fasting animal.

Not only do thyroglobulin and thyroxine possess this calorogenic effect, but other substances, closely related to thyroxine, also have this property, but to a less extent. According to Harington,⁶⁵ any change in the molecule of thyroxine diminishes its physiologic activity. Thus Canzanelli and Rapport⁶⁶ found that in the dog tyrosine in large doses has a calorogenic effect, but this is only one two-thousandth of that of thyroxine. I have given large doses of tyrosine (1.5 Gm. daily, equivalent to the tyrosine content in 40 Gm. of thyroid protein) to 2 patients with myxedema without observing any metabolic change.⁶⁶ The former investigators also reported that diiodotyrosine is seven and a half times as active as tyrosine, diiodothyronine fifteen times as active as diiodotyrosine and thyroxine seventeen times as active as diiodothyronine. Thompson and co-workers⁶⁷ found some calorogenic action in diiodotyrosine when it was given to patients with myxedema, but only one ten-thousandth of that of thyroxine. Lerman and Salter⁶⁸ found that crystalline 3,5-diiodothyronine and an iodothyronine-like substance derived from artificial iodo-protein each has an activity about one thirtieth to one fortieth of that of whole thyroid in terms of iodine.

Thus one must consider a molecule containing two atoms of iodine attached to a tyrosine nucleus as the minimum requirement for a substance having thyroxine-like physiologic properties. As indicated before, Harington⁶⁵ has claimed that in the body tyrosine is converted into diiodotyrosine, which is then elaborated into diiodothyronine and then into thyroxine. That such changes take place is suggested by the work of Salter and Lerman,⁶⁸ already referred to, on the formation of active

protein from the inert diiodotyrosine peptone, which on redigestion yields "thyroxine-like" and "diiodotyrosine-like" peptones. The genesis of thyroid hormone may then be viewed as consisting of two processes: one, the building up of colloidal molecules from simpler polypeptide chains; the other, the combination of iodinated tyrosine residues to form iodinated thyronine residues. The mechanism of the second process is suggested by the work of Cohn, Salter and Ferry,⁶⁹ who showed that under certain conditions the phenolic groups of diiodotyrosine may undergo conjugation to form an iodized thyronine nucleus.

An important finding in this connection is that of Lerman and Salter,⁶⁸ Abelin⁷⁰ and Ludwig and von Mutzenbecher⁷¹ that the simple process of iodinating protein by means of a gentle chemical reaction generates thyroid-like activity. It may be that simply the introduction of iodine into the tyrosine nucleus in the protein chain results in thyroid hormone. The significance of this is that the thyroid may not be the factory for the hormone but merely the storehouse for its distribution.

Action on Growth, Maturation and Differentiation of Tissue.—Congenital athyreosis in the human subject results in the dwarfism and juvenile habitus of the cretin. When thyroid is administered, growth is resumed. Conversely, a child suffering from thyrotoxicosis tends to be definitely taller than the average for the age. The failure of the cretin to attain the adult habitus is evidence that the thyroid plays a role in the maturation of the organism. In adult animals, according to Marine,⁷² thyroidectomy produces little objective change, but in young ones thyroidectomy leads to stunted physical, mental and sexual development. This effect is more strikingly seen in the metamorphosing amphibia. Gudernatsch⁷³ showed that tadpoles metamorphose at an accelerated rate when thyroid is administered. Similar results have been obtained by Uhlenhuth⁷⁴ in the salamander. In both instances the animals mature to adulthood but do not change much in size.

The effect on the growth of individual tissues is seen in the retarded skin, hair and nail change in myxedema and in the delayed bony development in childhood athyreosis, i. e., delay in the appearance of ossification centers as well as in epiphyseal union. In contrast, thyroxine stimulates growth of epiphyseal cartilage in rabbits (Coryn⁷⁵) and markedly accelerates the rate of eruption of incisor teeth in rats (Karnofsky and Cronkite⁷⁶).

The growth-promoting action of the thyroid is, in all probability, a phase of its action on metabolic processes in general. According to Hammett,⁷⁷ the thyroid

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hormone is concerned more with growth by increase in cell size than with growth by increase in cell number. It is essentially different from the growth hormone of the anterior lobe of the pituitary. However, there appears to be a synergism between the thyroid and the growth hormone of the anterior lobe of the pituitary. According to Evans, Simpson and Pencharz,⁷⁸ thyroid, which promotes normal growth of thyroidectomized animals, does not have this effect on hypophysectomized animals. Conversely, the growth produced by the growth hormone of the anterior lobe of the pituitary, although not dependent on the presence of the thyroid, is greater when the thyroid is intact. It is of interest that Sternheimer⁷⁹ obtained changes in liver glycogen, sugar and protein by the single injection of thyroxin which are consistent with those seen in growing tissues. These changes take place before the rise in oxygen consumption.

Action on the Distribution of the Water, Salts and Colloids of the Body.—When the organism is deprived of the thyroid, there takes place storage of water, salts and protein. In 1925 Boothby and associates⁸⁰ showed that in human myxedema a large amount of extra protein—so-called “deposit protein”—is stored in the body. It is contained in the body fluids and not in the cell protoplasm. When thyroid is administered, this extra deposit protein is quickly oxidized and eliminated in the urine along with the extra salts and water held in combination with the protein. Consequently, an appreciable diuresis is a characteristic finding when active hormone is administered to myxedematous patients for the first time. In fact, the diuretic action of thyroid may also be striking in normal persons, and is made use of in the treatment of nephrosis. The work of Byrom⁸¹ indicates that the diuresis produced in patients with myxedema is accompanied by a loss chiefly of sodium salts, whereas in normal persons the loss is chiefly of potassium salts. Consequently, in the former the fluids are derived largely from extracellular sources whereas in the latter the fluids are derived largely from intracellular sources. This confirms Boothby's findings, mentioned earlier in this paragraph. Byrom has suggested that the abnormally collected protein in myxedema is in the nature of a mucoprotein derived from the ground substance of the cell. Since fetal tissue, like myxedematous tissue, contains an excess of mucin, it seems that one function of the thyroid is to provide the cells with a “mature” type of environment.

Soon after Boothby's work became known, Thompson⁸² described a significant reduction in plasma volume in myxedema and a return to normal on treatment with thyroid. These results have been confirmed by Gibson and Harris,⁸³ who made the additional finding that the blood volume in thyrotoxicosis tends to be above normal. Along with the reduced plasma volume there is an increased concentration of plasma protein, with a cor-

responding increase in spinal fluid protein (Thompson and co-workers⁸⁴). On administration of thyroid both the plasma and the spinal fluid revert to normal. In thyroidectomized animals the changes in the blood are similar to those in myxedema.

The metabolism of various inorganic salts is bound up with the state of thyroid activity. Aub and collaborators⁸⁵ showed that in hypothyroidism there is a diminished rate of exchange of calcium and phosphorus, the amounts eliminated in the urine and stool being less than in the normal person. The actual concentrations in the blood are not greatly altered. The reverse holds when thyroid is administered and in spontaneous hyperthyroidism. These effects, according to Low, Wilson and Aub,⁸⁶ are not brought about by changes in phosphatase activity in the bones. Talbot,⁸⁷ however, described low phosphatase in children with untreated hypothyroidism, associated with delayed osseous development. Thyroid treatment repairs these abnormalities. In the growth period the effect of thyroid on calcium metabolism may be different from that in later life. Thus Maroney and Johnston⁸⁸ found that retention of calcium and nitrogen was increased by the administration of thyroid to a cretin and to an adolescent after thyroidectomy. When administered in large doses thyroid may actually lead to premature cessation or retardation of growth (Smith and McLean⁸⁹).

The metabolism of other inorganic salts is affected in the same manner as that of calcium and phosphorus. The blood levels of sodium and chloride in hypothyroidism are within normal limits,⁹⁰ but the urinary excretion of chlorides, according to Stephens⁹¹ and Dr. Patricia Smith (personal communication), is low. These findings help differentiate myxedema due primarily to dysfunction of the thyroid from that due primarily to dysfunction of the pituitary.⁹² In the latter, blood sodium and chloride are low and their excretion in the urine high (adrenal cortex insufficiency). The administration of thyroid restores the excretion of salt in primary hypothyroidism to normal, but in hypothyroidism secondary to pituitary dysfunction, by increasing the already excessive loss of salt, it may throw the patient into an Addisonian crisis.

It should be indicated at this point that thyroid hormone also has an important control over blood lipoids. The blood cholesterol is elevated in hypothyroidism and decreased in hyperthyroidism. In fact, there is a close reciprocal relationship between basal metabolic rate and blood cholesterol.⁹³ On the experimental side Schmidt and Hughes⁹⁴ found that hyperthyroidism produces no change in cholesterol. Thyroidectomy, however, pro-

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duces a rise in which the normal ratio of free to esterified cholesterol is preserved. Thyroxin merely restores the normal level. In the rabbit I have been unable to find any change in blood cholesterol after complete thyroidectomy.⁹⁵ This finding may be due to the fact that the fat content of the rabbit's diet is low.

Action on Carbohydrate Metabolism.—Coggeshall and Greene⁹⁶ showed that thyroid feeding depletes hepatic glycogen even though the animals are on a diet high in carbohydrate. The conclusion was drawn that thyroid hormone not only depletes hepatic glycogen but also injures the liver so that it is unable to store glycogen. Conversely, thyroidectomy leads to excessive storage of glycogen in the liver. One frequently observes aggravation of latent or mild diabetes mellitus with the onset of hyperthyroidism. If myxedema and diabetes coexist, the relief of the myxedema intensifies the diabetes; on omission of thyroid the diabetes becomes milder. In fact, total thyroidectomy has been used in the treatment of diabetes mellitus.

Barnes⁹⁷ reported that feeding thyroid to the "Hous-say dog" does not increase the mild glycosuria. He suggested that thyroid may exert its influence on carbohydrate metabolism through the pituitary which, in turn, may act on the adrenals. Similarly, thyroidectomy in pancreatectomized animals does not affect the diabetes in the way pituitarectomy (Houssay) or adrenalectomy (Long) does (Long;⁹⁸ Dohan and Lukens⁹⁹). On the other hand, Soskin and co-workers¹⁰⁰ reported that the administration of thyroxin to hypophysectomized dogs helps maintain their normal blood sugar during periods of fasting, probably by increasing protein catabolism.

Action on the Nervous System.—The action of the thyroid on the nervous system is best observed in states of excess or of scarcity of the hormone. In the former case the person has emotional instability, increased irritability and sometimes gross disturbance in cerebation. In the latter case the person lives at a low emotional level, reacts sluggishly and cerebrates slowly; the memory is poor, and there is diminished sensory acuity. The effect of the thyroid on the vegetative nervous system is manifested by increase in vasomotor activity, peristaltic activity and activity of the sweat glands in thyroid intoxication and by the reverse of these phenomena in thyroid deprivation. An objective approach to evaluate this function of the thyroid was made by Ross and Schwab.¹⁰¹ They found that the cerebral cortical alpha rate, as obtained by the electroencephalogram, is low in myxedema and returns to normal with the administration of thyroid. There is a good correlation between the alpha rate and the state of metabolism.

Action on the Muscular System.—In thyrotoxicosis there are changes in skeletal muscle which vary from mild myasthenia to advanced muscular atrophy, with

corresponding degenerative changes in the muscle fibers. In hypothyroidism there is hypotonicity. Histologically, there is interstitial edema of muscle fibers. Spontaneous creatinuria is a characteristic finding in hyperthyroidism. According to Richardson and Shorr,¹⁰² creatine tolerance is decreased in thyrotoxicosis, and as thyrotoxicosis declines creatine tolerance rises. Thorn¹⁰³ also found decreased creatine tolerance in hyperthyroidism and increased tolerance in myxedema. A useful correlation between total basal caloric output (a gage of the level of thyroid activity) and creatinine excretion (a gage of active muscle mass) has been obtained by Talbot, Worcester and Stewart,¹⁰⁴ confirming the earlier results of Palmer, Means and Gamble.¹⁰⁵

Action on the Circulatory System.—The action of the thyroid on the circulation may be accounted for chiefly by its other actions, already discussed. A heightening in metabolism produced by thyroid calls forth an increased mass movement of blood. This is forthcoming from the more rapid heart action, the peripheral dilatation and the increased stroke volume of the heart. In hypothyroidism the reverse of these activities is observed. According to Zondek,⁶² there is also a shift in the oxygen dissociation curve of the blood which facilitates delivery of oxygen to the tissues as metabolism rises. Increased cardiac irritability and tone in thyrotoxicosis and lowered tone in myxedema may be due to direct action of the thyroid hormone on the cardiac musculature. The cardiac enlargement so characteristic of myxedema is due to a combination of diminished cardiac tonus and myxedematous infiltration of the cardiac musculature. When thyroid is administered, edema disappears, tonus increases and heart size shrinks (Lerman, Clark and Means¹⁰⁶).

Miscellaneous Actions of Thyroid Hormone.—Several actions of the thyroid are difficult of classification, but as knowledge improves their true significance should become clear.

Tolerance to some types of drugs is in some manner related to thyroid function. According to Benedict¹⁰⁷ (and my co-workers and I confirm it), patients with myxedema tolerate morphine poorly. It is our impression that such patients also tolerate digitalis poorly. On the other hand, patients with hyperthyroidism tolerate morphine and other sedative drugs extremely well. These findings may be attributed to the metabolic action of thyroid. In the same category is the acetonitrile reaction of Hunt¹⁰⁸—the increased resistance of mice to acetonitrile, produced by the feeding of thyroid—and the increase in fluorine toxicity in animals receiving thyroid (Phillips, English and Hart;¹⁰⁹ Wilson and De Eds¹¹⁰).

In the field of animal husbandry, two types of speed-ups attributable to thyroid have been recently reported. The rate of egg laying by hens receiving thyroid is

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increased above normal (Winchester¹¹¹); also the production of milk and milk fat by cows is increased by thyroid (Graham¹¹²) and reduced by thyroidectomy.

Althausen and Stockholm¹¹³ have shown that absorption from the gastrointestinal tract is regulated by the level of thyroid activity. Thus the absorption of various sugars is slow in thyroidectomized animals and rapid in hyperthyroid ones. In the light of these results dextrose tolerance tests in patients with myxedema and in patients with exophthalmic goiter acquire new significance.

The thyroid controls the blood-forming organs in a manner that is not clearly understood. In hyperthyroidism an excess of mononuclear cells in the blood stream is a frequent finding (Hertz and Lerman¹¹⁴); in myxedema moderate anemia is common (Lerman and Means¹¹⁵).

BLOOD IODINE

Of the normal blood iodine of about 8 to 10 micrograms per hundred cubic centimeters of blood, a small portion is due to circulating inorganic iodine, representing exogenous material; the remainder is due to organic iodine and may represent the amount of circulating hormone. The concentration of iodine in the blood fluctuates. Diet, exercise, medication and season are among the factors influencing the level of blood iodine (Salter¹¹⁶). The level fluctuates with thyroid function—it is lowered in myxedema and raised in thyrotoxicosis.

The nature of the organic iodine in the blood has been a puzzle. Lunde, Closs and Pedersen¹¹⁷ separated total iodine into alcohol-soluble and alcohol-insoluble fractions. According to Salter,¹¹⁶ such separations are artificial. Recent experiments indicate that most of the iodine is bound to protein but can be extracted from the protein by butyl alcohol (Trevor¹¹⁸). This extract, in turn, can be separated into "thyroxin-like" and "diiodotyrosine-like" fractions. Salter has suggested the following classification of iodine fractions in the plasma: (1) "I" iodine, nonprecipitable and presumably inorganic, and (2) "P" iodine, the maximum amount precipitated with the protein. The "P" fraction may then be separated into a "T" (thyroxin-like) fraction and a "D" (diiodotyrosine-like) fraction. Indeed, Trevor¹¹⁸ found the ratio of "T" to "D" blood iodine the same as the ratio of these fractions in human thyroids.

That the blood contains circulating hormone is indicated by the fact that the oxygen consumption of mouse liver is increased by the addition of blood from patients with exophthalmic goiter and decreased by blood from myxedematous patients as compared with normal blood (Salter and Craig¹¹⁹). The failure of crystalline

thyroxin to increase the consumption of oxygen is presumptive evidence that the circulating hormone is not the same as thyroxin. Canzanelli and Rapport¹²⁰ also found that thyroxin does not increase the metabolism of tissues in vitro, whereas thyroglobulin does. The phenomena observed by Salter and Craig are "thyroglobulin-like" rather than "thyroxin-like." In addition Perkin has been unable to recover thyroxin from the organic iodine fraction in his method of separating organic and inorganic iodine in the blood.¹²¹ He is able to recover injected crystalline thyroxin from the organic fraction by the same technic after a lapse of three days. He concludes that the "thyroxin-like" fraction in the blood is not the same as crystalline thyroxin.¹²¹

As indicated, I¹⁶ have been unable to detect any thyroglobulin in the serum of normal persons or of patients with myxedema or hyperthyroidism. Consequently, it seems unlikely that intact thyroglobulin is represented in the organic iodine fraction.

RELATION OF THE THYROID TO OTHER ENDOCRINE ORGANS

It is obvious that in a complex mechanism like the body the thyroid is only one link in the elaborate coordinating system of glands. It acts on its endocrine partners and is in turn acted on by them, particularly by the central gland—the pituitary. The thyroid may influence other endocrine glands in several ways: (1) by a specific influence on all endocrine glands, (2) by a specific influence on the pituitary, (3) by a calorogenic effect on all endocrine glands and (4) by a calorogenic effect on the pituitary.

The effect of the thyroid on the pituitary is especially significant. Through this mechanism the thyroid indirectly controls the function of all glands and organs regulated by the pituitary. The thyroid, in turn, is controlled by the secretions of other glands or organ metabolites by way of the blood stream or by way of the nervous system. It is of interest that Foot, Baker and Carrel,¹²² cultivating human thyroids in toto in the Lindbergh apparatus, showed that the histologic picture reached by the gland seems determined not by the phase of activity which existed while it resided in the body but by the nature of the perfusate used during its existence in vitro. In other words, it seems that humoral factors reaching the gland are more important than the condition inherent in the gland.

Pituitary.—Inasmuch as the pituitary-thyroid relationship is discussed fully in another chapter, I shall merely touch on the high lights. Knowledge of this relationship probably began with the observation of Rogowitsch¹²³ that in rabbits total thyroidectomy causes pituitary hypertrophy. It was shown by Housay and associates¹²⁴ that the compensatory hyperplasia following subtotal thyroidectomy does not take place in the absence of the hypophysis. Moreover, according to the recent review by Means,¹²⁵ there is more thyrotropic activity in the blood and urine of

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myxedematous patients and patients who have undergone thyroidectomy, and less in the blood and urine of thyrotoxic patients before operation, than in the blood and urine of normal persons.

There is considerable experimental evidence that the thyroid hormone exercises a depressing effect on the thyrotropic function of the anterior lobe of the pituitary (Aron and co-workers;¹²⁶ Kuschinsky;¹²⁷ Marine;¹²⁸ Uotila¹²⁸). Uotila found that thyroxin produces atrophy of the thyroid to the same degree that hypophysectomy does and attributed the atrophy to the depressing effect of thyroxin on the anterior lobe of the pituitary. It is of interest in this respect that Belasco¹²⁹ observed a diminution in the consumption of oxygen by thyroid tissue excised from animals previously given injections of thyroxin.

Conversely, numerous investigators have shown that pituitaryectomy results in involution of the thyroid. The syndrome described by Simmonds in 1914 represents the equivalent in man of total hypophysectomy. The essential symptoms are progressive wasting, weakness, subnormal metabolism, hypotension, hypoglycemia and cessation of sexual activity. Pathologically, there is hypoplasia of all the endocrine glands. In most instances the picture of full blown atyreosis is not present. In a few cases, however, as recently described by Means, Hertz and Lerman,⁹² the dominant feature is myxedema, i. e., pituitary myxedema. These patients require treatment by replacement with preparations of the various tropic substances in proper combination. Administration of thyrotropic extract alone (Bulger and Barr¹³⁰) or of thyroid alone (Means, Hertz and Lerman⁹²) will aggravate the condition due to adrenal cortex insufficiency and result in death. Thyroid treatment should be accompanied by therapy aimed to protect the adrenals, namely, the administration of large amounts of salts, anterior pituitary adrenotropic extract or extract of adrenal cortex, and gonadotropic extracts or androgen or estrogen.

The experiments of P. E. Smith, B. M. Allen and others have emphasized the role of the anterior lobe of the pituitary as the regulator of the thyroid. That the thyrotropic principle of the anterior lobe of the pituitary regularly causes thyroid hyperplasia, increased metabolism and other evidences of increased thyroid function is now well established. This action is probably directly on the thyroid cells, because isolated thyroid tissue may be stimulated to increased metabolism by an extract of anterior lobe containing the thyrotropic factor. Williams¹⁵ observed that the secretory cycle of thyroid follicles implanted in the rabbit's ear is accelerated by giving the animal thyrotropic material.

The relation of the posterior lobe to the thyroid is less clear than that of the anterior lobe. Mahoney and Sheehan¹³¹ produced experimental diabetes insipidus in dogs by placing a clip on the pituitary stalk, and were then able to abolish the diabetes by total thyroid-

ectomy. Feeding thyroid caused a return of the polyuria, which could then be abolished by injecting a solution of posterior pituitary. Apparently the diuretic action of thyroid may be antagonized by the antidiuretic action of the posterior lobe of the pituitary. In the rat, however, Swann and Johnson¹³² found little influence by the thyroid on the diabetes insipidus following removal of the posterior lobe of the pituitary. Thyroid administration does not affect the rat's fluid exchange.

Adrenal.—In Addison's disease there is often a moderate drop in basal metabolism. This is not due to any gross disturbance in the function of the thyroid, nor is there any histologic disturbance found in the thyroid at autopsy. In the experimental animal, on the other hand, Marine and Baumann¹³³ and Davis and Hastings¹³⁴ found that removal of the adrenals causes a rise in metabolism. Again, as Means, Hertz and Lerman⁹² emphasized, patients with hypofunction of the adrenal cortex, be it primary or secondary to pituitary disease, may be thrown into a crisis of adrenal failure by administration of thyroid. Zondek⁶² stated that thyroidectomized animals survive total adrenalectomy longer than those possessing thyroids. Thyroid administration produces enlargement of the adrenal cortex (Uotila;¹²⁸ Ingle and Higgins¹³⁵). Similarly Hoen, Langefeld and Oehme¹³⁶ showed that a large dose of desoxycorticosterone administered to guinea pigs antagonizes the rise in metabolism caused by thyroxin and also hinders the hypertrophy of the adrenal cortex seen in induced hyperthyroidism. On the other hand, Bock¹³⁷ showed that an extract of adrenal cortex plus thyroxin accelerates metamorphosis of tadpoles and axolotls at a greater rate than thyroxin alone. The administration of salt to hypophysectomized rats, according to Evans and co-workers,¹³⁸ produces a rise in their reduced metabolism, whereas the injection of salt into normal animals reduces their metabolism. Interestingly enough, the metabolism of one of our patients with pituitary myxedema was elevated fifteen to twenty points by therapeutic procedures aimed only at raising the levels of the blood sodium and chloride.

In myxedema the excretion of 17-ketosteroids in the urine—important evidence of adrenocortical function—is low (1 to 2 mg. in twenty-four hours). In pituitary myxedema the urine is practically free of ketosteroids. In the one the low excretion is probably due to the nonspecific effect of retarded metabolism of adrenal cells; in the other the absence of excretion is due to specific depression of adrenocortical function.

Experimental results from different sources all agree that administration of thyroid causes increased sensitivity of the organism to epinephrine. In the human subject this fact is the basis of the Goetsch

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132. Swann, H. G., and Johnson, P. E.: Thyroid Function in Diabetes Insipidus in the Rat, *Endocrinology* **24**: 397 (March) 1939.

133. Marine, David, and Baumann, E. J.: Influence of Glands with Internal Secretions on Respiratory Exchange: Further Data on Effect of Suprarenal Insufficiency (by Removal) in Rabbits, *J. Metabolic Research* **2**: 1 (July) 1922.

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137. Bock, K. A.: Die Einwirkung von . . . auf den Ablauf der Thyroxinmetamorphose . . . beim Axolotl, *Klin. Wchnschr.* **17**: 1311 (Sept.) 1938.

138. Evans, H. M.; Luck, J. M.; Pencharz, R. I., and Stoner, H. C.: The Calorigenic Action of Amino Acids in the Hypophysectomized Animal, *Am. J. Physiol.* **122**: 533 (May) 1938.

test for hyperthyroidism. At one time the author measured the response of the metabolism, pulse rate and blood pressure of patients with hyperthyroidism and with myxedema to a standard amount of epinephrine given intravenously. The changes were much greater in the group with hyperthyroidism than in the myxedematous group.¹³⁰ This exaggerated sensitivity of patients with hyperthyroidism to epinephrine, so suggestive of underfunction of the adrenal medulla, is at variance with the statement of Crile¹⁴⁰ that overfunction of the adrenal medulla is important in the genesis of exophthalmic goiter.

Gonads.—The evidence of a truly specific interrelationship between the thyroid and the gonads is conflicting. In hyperthyroidism the libido may be increased; in myxedema, diminished. This is not necessarily an expression of endocrine imbalance, but rather of the level of nervous irritability. In myxedema the gonadal function is present but low. This is indicated by the low urinary excretion of 17-ketosteroids (partly of gonadal origin in the male) and of estrogen. Administration of thyroid increases the output of these substances. In cretinism retardation of genital development is the rule. Similarly, thyroidectomy in young rabbits leads to sexual retardation.

Either hyperthyroidism or hypothyroidism may decrease fertility and produce abortion. The striking benefit obtained by us in the treatment of habitual abortion with thyroid is discussed by Means.¹ Similarly King and Herring¹⁴¹ reported benefit from the treatment of habitual abortion with thyroid.

The characteristic menstrual pattern in thyrotoxicosis is oligomenorrhea or amenorrhea, and in myxedema before the menopause, menorrhagia. These symptoms may be explained on the basis of the nonspecific action of thyroid hormone on gonadal cells, or, in the light of recent experiments, on the basis of a specific effect on the gonads. Several investigators have shown that thyroxin causes degeneration of the ovaries. Uotila¹²⁸ found that thyroxin produces atrophy of the seminal vesicles of the rat, probably by depressing the output of gonadotropins by the anterior lobe of the pituitary. Smelser¹⁴² explained such findings by an increase in the threshold of response to gonadotropic and androgenic hormones in animals with hyperthyroidism. Tyndale and Levin¹⁴³ concluded that thyroid hormone exerts an inhibiting action on the gonads directly. In any case the action of thyroxin may be such as to produce a state of low estrogenic function. In myxedema the reverse of this situation will be true—a state of relative “hyperestrinism” (metropathia hemorrhagica) is produced.

Recently we have observed several patients with myxedema due to primary dysfunction of the thyroid who had amenorrhea not attributable to the menopause. The hormonal balance, as far as the usual tests show, was not unusual. On administration of thyroid the ovarian cycles of these patients became normal. The

most likely explanation is that the ovarian cycle in such cases is normal but the flux of hormones is at a low level (as a result of the low metabolism of the cells). Consequently the phases of endometrial congestion and proliferation are insufficient to produce clinical menstrual bleeding. Thyroid, by stimulating the ovary, increases the production of estrogen and progesterin, and the normal cycle returns. This conception fits with the observations of Grumbrecht¹⁴⁴ that thyroid increases the weight of ovaries of infantile rats receiving a constant dose of gonadotropic substance, the increase in weight being proportional to the dose of thyroid.

The evidence of gonadal influence on the thyroid is less conclusive. Gessler¹⁴⁵ showed that estrogen lowers the basal metabolic rate of normal guinea pigs and hypophysectomized rats, and Sherwood¹⁴⁶ found that estrogen reduces the duration of thyroid intoxication of rats. According to Smelser,¹⁴² the amount of androgen necessary to stimulate accessory sex organs of castrates is increased fivefold in thyroxin-treated animals. In fact, Starr and Patton¹⁴⁷ induced remissions in exophthalmic goiter by injecting an extract of pregnancy urine. They suggested that the excess of estrogen produced by the gonadotropic material from pregnancy urine depressed the thyroid directly. On the other hand, Marine¹² stated that “total removal of the gonads in the dog, rabbit and rat usually leads to a slow involution of the thyroid in about one month and to slight reduction of total metabolism.” This is confirmed by the results of Ross.¹⁴⁸ Moreover, it has been noted by several workers that estrogen causes a rise in metabolism in normal and in ovariectomized animals; androgen also is said to stimulate the thyroid (Nathanson and collaborators¹⁴⁹). These discrepancies may be explained by the observation of Pincus and Werthessen¹⁵⁰ that injections of estrogen into animals over a short time (five to ten days) lead to thyroid enlargement whereas injections over a longer time (twenty days or more) lead to thyroid involution. Such observations plus the finding of atrophy of the interstitial cells in a patient with myxedema¹⁵¹ led Marine to suggest that gonadal atrophy may play a role in the etiology of myxedema. In our own experience castration does not lead to the development of thyroid disease.

Pancreas.—The interrelationship of the pancreas and the thyroid has already been touched on. The well known deleterious effect of thyroid on the severity of diabetes mellitus may not be due to a specific antagonism between thyroid and insulin but may be the result of the characteristic action of thyroid in increasing metabolic rate. Some observers believe that the thyroid and pancreas are antagonistic. Bodansky¹⁵² reported

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148. Ross, J. H.: The Effect of Estrogen on the Thyroid Gland of the Rat, Arch. f. 149.

149. Nathanson, K. L., and Rawson, R. W.: Effect of Testosterone Propionate upon Thyroid and Parathyroid Glands of Intact Immature Female Rats, Proc. Soc. Exper. Biol. & Med. 43: 737 (April) 1940.

150. Pincus, Gregory, and Werthessen, N.: Continued Injection of Oestrin into Young Rats, Am. J. Physiol. 103: 631 (March) 1933.

151. Marine, David: Changes in the Interstitial Cells of the Testes in Gull's Disease, Arch. Path. 28: 65 (July) 1939.

152. Bodansky, A.: Effect of Thyroidectomy upon the Reaction of Sheep to Insulin, Proc. Soc. Exper. Biol. & Med. 21: 46 (Oct.) 1923.

that thyroidectomized sheep are more sensitive to insulin than normal animals. Conversely, thyroid administered to thyroidectomized rabbits decreases the hypoglycemic action of insulin. He attributed these results to the action of thyroid in promoting glycogenolysis. In our own experience the action of insulin on the blood sugar in myxedema is as follows: The drop in blood sugar from the fasting level requires forty-five to sixty minutes, against a normal of twenty to thirty minutes; the level of depression may be as low as in the normal or lower; the return of the blood sugar to fasting levels requires two hours or more as against a normal of ninety minutes. These results may easily be explained by the fact that all metabolic processes (including the burning of sugar, storage of glycogen and mobilization of epinephrine) are slow in hypothyroidism.

Parathyroid.—There is little evidence of interrelationship between the thyroid and the parathyroid glands. The effect of thyroid on the calcium and phosphorus metabolism is undoubtedly due to the rate of turnover of these elements between bones, blood and kidneys. Consequently, thyroid administration (Aub and associates¹⁵³) or spontaneous thyrotoxicosis (Cope and Donaldson¹⁵⁴) may raise the level of blood calcium in hypoparathyroidism.

Thymus.—It is well known that the endocrinology of the thymus is yet to be discovered. A relationship between the thyroid and the thymus is suggested by the work of Gudernatsch,⁷³ who found that tadpoles fed thymus show acceleration of growth and failure of metamorphosis whereas those fed thyroid show the reverse. Speidel¹⁵⁵ noted that feeding thyroid to tadpoles causes proliferation of the thymus. The enlarged thymus in the patient with exophthalmic goiter is a well known finding. Similarly thyroidectomy hastens involution of the thymus (Marine and co-workers;¹⁵⁶ Chiodi¹⁵⁷). On the other hand, Richter and Wislocki¹⁵⁸ reported evidence contradicting the aforementioned observations. In hypophysectomized rats, whereas the thyroid and adrenals are hypoplastic, the thymus and lymph nodes are hyperplastic.

THYROID AND NUTRITION

It has long been known that thyroid hypertrophy and hyperplasia develop in animals on a high fat or a high protein diet. Rabbits kept on a cabbage diet (Chesney, Clawson and Webster¹⁵⁹) or a diet of alfalfa hay and oats (Marine and Baumann¹⁶⁰) and rats kept on a

soybean diet (Sharpless, Pearsons and Prato¹⁶¹) develop thyroid enlargement. Similarly, animals deficient in iodine or in vitamin D have hyperplastic glands. Conversely, the thyroids of undernourished animals undergo involution—the cells become flat and the follicles distended with colloid (Rabinovitch;¹⁶² Stephens¹⁶³). Stephens offered the interesting suggestion that the changes in inanition are due to suppression of thyrotropic hormone.

In general, the metabolism of vitamins, as well as the metabolism of ordinary food substances, is regulated by the thyroid. Consequently, the need for vitamins parallels the rate of metabolism. Himwich and co-workers¹⁶⁴ showed that vitamin B spares the weight loss induced by thyroid. In patients with hyperthyroidism vitamin B in the form of yeast does not cause reduction in metabolism but improves the appetite and causes weight gain.¹⁶⁵ The author recently observed in a patient, a lifelong "imbiber," that acute peripheral neuritis developed as soon as hyperthyroidism developed. According to Drill,¹⁶⁶ there is no lack of vitamin B₁ in hyperthyroid animals nor is the urinary excretion of this vitamin affected. Such results are to be explained by the increased intake of food by such animals.

There is a marked reduction in the vitamin C content of tissues of rats made toxic with thyroid (Sure and Theis¹⁶⁷), and excretion of vitamin C is diminished in patients with hyperthyroidism (Lewis¹⁶⁸).

Several investigators have reported an antagonism between vitamin A and thyroxine. The literature on this subject was reviewed by Wohl and Feldman,¹⁶⁹ who reported pathologic dark adaptation in hyperthyroidism; they attributed this to rapid destruction of vitamin A. They also reported pathologic dark adaptation in myxedema, which they attributed to failure of conversion of carotene to vitamin A in the absence of thyroid hormone. Similarly, carotene diminishes the metabolic effect of thyroid (Smith and Perman¹⁷⁰). On the other hand, Sure and associates¹⁷¹ reported marked loss of weight of the thyroid and of other endocrine glands in vitamin A deficiency and in riboflavin deficiency, and Cutting and Robson¹⁷² found that none of the vitamins (A, B₁, B₂, C and D) have any effect on the metabolic rate of guinea pigs with experimental hyperthyroidism induced by a thyrotropic substance.

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ION TRANSFER (IONTOPHORESIS)

Council on Pharmacy and Chemistry and the Council on Physical Therapy

QUESTIONS RELATING TO THE METHOD FOR ADMINISTERING ACETYL-BETA-METHYLCHOLINE (MECHOLYL, MERCK & COMPANY, INC.) WHICH AROSE DURING THE COUNCIL ON PHARMACY AND CHEMISTRY'S CONSIDERATION OF THE DRUG WERE REFERRED TO THE COUNCIL ON PHYSICAL THERAPY. THAT COUNCIL VOTED TO GIVE CONSIDERATION TO APPARATUS FOR THE ADMINISTRATION OF DRUGS BY ION TRANSFER AND PREPARED A STATEMENT, WHICH IS REPRODUCED AS THE FIRST PART OF THE FOLLOWING REPORT. THE COUNCIL ON PHARMACY AND CHEMISTRY VOTED TO RECOGNIZE THE USE OF ACETYL-BETA-METHYLCHOLINE CHLORIDE BY THE METHOD OF ION TRANSFER PROVIDED THE FIRM PLACED ON ITS LABELS AND IN ITS ADVERTISING CAUTION STATEMENTS AS STIPULATED. THIS RECOGNITION DOES NOT CARRY WITH IT ANY IMPLICATION OF ACCEPTANCE FOR THE USE OF ANY OTHER DRUGS BY THIS METHOD WITHOUT INDIVIDUAL CONSIDERATION AND ACCEPTANCE BY THE COUNCIL ON PHARMACY AND CHEMISTRY.

THE FOLLOWING REPORT HAS BEEN AUTHORIZED FOR PUBLICATION AFTER CONSIDERATION BY BOTH COUNCILS.

THEODORE G. KLUMPP, M.D., SECRETARY,
COUNCIL ON PHARMACY AND CHEMISTRY,
HOWARD A. CARTER, SECRETARY, COUNCIL
ON PHYSICAL THERAPY.

ION TRANSFER (IONTOPHORESIS)

Direct or galvanic current, in addition to being used for muscle or nerve stimulation, may be used to deposit on or in the tissues ions of certain salts and charged colloid particles from solution. "Ion transfer" is defined as the introduction of soluble salts into the tissues by means of direct current. The term "electrophoresis" applies to a similar movement of colloid particles which are electrically charged or which have absorbed charged particles. The salts of heavy metals such as copper, zinc or tin are frequently used. Locally these ions may produce precipitation of protein, causing chemical destruction of ions moving through the tissues toward the cathode when the current is appropriately passed. The introduction of certain drugs of the mucous membrane in the practice of proctology, otorhinology and gynecology. This form of treatment has been used in lesions into the tissues by the method of ion transfer (iontophoresis) may also be used to produce systemic effects.

The galvanic current is uninterrupted and unidirectional, and for therapeutic purposes the usual sources are the galvanic wall plate, the motor generator, the valve tube rectifier or the dry cell battery. The efficacy of ion transfer depends on greater penetration of medicaments into the tissue than is obtained by topical application. The depth and local concentration of the medicaments depend on at least two factors. First, although the solution of the medicament is an excellent medium for conducting the current into the tissues, the ions, once introduced, may either become reduced or oxidized to an inactive form or immediately precipitated as proteinates. Second, because of high velocity the ions may be readily eliminated by the body because they are continually swept into the systemic circulation by rapidly moving blood, so that their concentration is too low to be effective. These factors explain why the penetration of medicaments is limited to a few millimeters at most.

The following technic is suitable for introducing drugs by ion transfer: The active electrode should consist of material such as asbestos cloth, cotton gauze, stockinet or other suitable fabric resistant to tears, saturated with a solution of the desired medicament. The saturated fabric is wrapped closely around the part to be treated, and a strip or sheet of metal foil cut to the appropriate size and shape is wound over the fabric. The positive pole of the current source is connected to one end of the metal strip which is used to conduct the current evenly over the entire area treated. The negative pole is connected

1. Although "ion transfer" is the preferred term, introduction of drugs by this method for the production of local or systemic effects is sometimes called "iontophoresis," "common ion transfer," "ionization," "medicament ionization," "ionic medication" or "therapeutic ionization." It is electrochemically incorrect and clinically misleading to term this method "surgical ionization" when a caustic effect is produced.

to a dispersive electrode applied to the patient's back, which completes the circuit. The dispersive electrode consists of a large, flat, moistened pad measuring about 10 by 12 inches. The direct current should be turned on and increased gradually until the desired milliamperage is reached, so that unpleasant effects caused by sudden increases are avoided. The rate and amount of the ion transfer may be regulated by the strength of the current and the duration of its flow respectively.

Individual tolerance to the treatment should serve as a guide in determining the strength of the current to be used. The initial treatment should not exceed 5 or 10 milliamperes for thirty minutes. At the conclusion of a treatment the current should remain quiet and warm for thirty to sixty minutes following a treatment; after this period he may resume his usual activities. Each treatment should be restricted to a limited area, such as one hand or one joint when several parts are involved. Three or four days appears to be the most satisfactory interval between treatments.

In the treatment of varicose ulcers, the foot and leg as high as the knee are wrapped appropriately in fabric saturated with medicament and the technic described is then followed. Under no circumstances should the moistened fabric or the metal plate be applied directly over the unhealed ulcerated region. Treatment is usually given two or three times a week but in some cases may be repeated daily.

PRECAUTIONS

The following precautions in the application of ion transfer should be observed:

1. If the sensation of the patient's skin is not normal on treatment the current strength must be proportionally selected and carefully controlled according to the size of the electrodes and the milliamperage reading.
2. Electrodes must not be applied over denuded areas and must be very carefully applied over recent scar tissue.
3. Electrodes must be sufficiently large to avoid excessive current density.
4. The metal plate of the electrode must be evenly covered by the padding, leaving no bare edges in contact with the skin.
5. The pad covering the electrode must be evenly saturated with the appropriate solution.
6. The electrodes must be applied in good contact by means of even pressure. Tight bandaging, folds, creases and insufficiently moistened areas in the pads may cause nonuniform distribution of current, subjectively manifested first by a local burning sensation.
7. The conducting wires must be fastened securely to the electrodes, so that the metal of the wire tip does not come in contact with the skin.
8. The current must be increased slowly at the start; while never be opened or closed sharply.
9. The patient must be instructed to report at once any excessive burning or pain. The judgment of patients as to sensation of burning or pain varies with the individual and, regardless of the milliammeter reading, no more current than the patient states is comfortable should be applied. A safe milliammeter reading must never be exceeded even if the patient states that he can stand more current. During a treatment, the milliammeter reading usually increases as skin resistance decreases; a decrease usually indicates that the pads have become partially dry. In remoistening of the pads the current must be turned off, after which the electrodes are removed, and the pads are moistened evenly and carefully reapplied.
10. The strength of the current must be decreased if at any time the patient complains of annoying sensations. If this reduced current does not provide relief, the current must be turned off, the electrodes removed and the cause of irritation determined.

ACETYL-BETA-METHYLCHOLINE (MECHOLYL)
A 0.2 to 0.5 per cent solution of acetyl-beta-methylcholine chloride (mecholyl chloride) may be introduced by ion transfer. (The Councils point out that a 1:1,000 (0.1 per cent) solution of histamine acid phosphate introduced by ion transfer will

produce a nearly identical effect.) The disadvantages in administering mecholyl chloride by ion transfer are (1) difficulty in controlling the dosage, (2) costliness of the drug and (3) administration expense—it requires thirty minutes of an attendant's time.

From a review of the evidence now available, the Council on Pharmacy and Chemistry reached the following conclusions:

1. Local effects of mecholyl chloride on the extremities are best obtained when the drug is administered by the method of ion transfer.

2. General effects of mecholyl chloride may be observed during ion transfer, but these are less pronounced when the drug is given by this method than when the subcutaneous route is employed; general effects of a serious or dangerous nature have not been observed when the drug has been given by this method.

3. Mecholyl chloride may be used by this method without obvious harm and with considerable benefit in some cases of chronic ulcers, Raynaud's disease, scleroderma and certain vasospastic conditions of the extremities.

4. The drug used by this method appears to have a palliative effect on the discomfort in some cases of chronic rheumatoid arthritis.

The Council on Pharmacy and Chemistry decided that ion transfer as a method of administering drugs be recognized by the Council with the understanding that the application of the method must at present be reserved to those especially trained and further that the recognition of the method as such carries with it no implication of acceptance of its use for any particular drug.

Council on Pharmacy and Chemistry

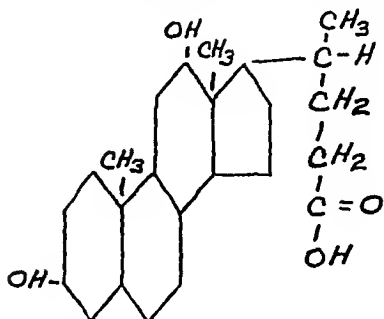
PRELIMINARY REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

THEODORE G. KLUMPP, M.D., Secretary.

DEGALOL (DEOXYCHOLIC ACID)

Under the trade name Degalol, Riedel-de Haen, Inc., submitted for consideration of the Council a preparation of pure deoxycholic acid derived from ox bile, proposed for use in aiding fat digestion and absorption of fat and the fat soluble vitamins A, D and K. According to information furnished by the firm, the product is marketed in 1½ grain tablets flavored with oil of peppermint and is recommended in doses of two tablets three times daily. Deoxycholic acid has the following structural formula:



The firm's submitted advertising includes a bibliography of references to published papers in support of claims that, in addition to a mild cholagogue and choleretic influence, Degalol (deoxycholic acid) is the most effective bile acid for promoting the intestinal absorption of fats. It is claimed that "The isolation of deoxycholic acid and the elimination of ineffective bile acids makes it possible to give smaller and more effective doses of Degalol than of 'bile salts' derived either from ox bile or hog bile" and that "This is of particular importance in a jaundiced patient where the administration of large doses of 'bile salts' increases intrahepatic bile pressure and raises still further the contents of bile acids, and possibly bile pigments, in the blood."

A review of the available evidence concerning deoxycholic acid reveals that the terms "choleic acid" and "deoxycholic acid"

were used indiscriminately for three decades until Wieland and Sorge¹ discovered that choleic acid was a coordination compound of eight molecules of deoxycholic acid with one molecule of a fatty acid and found that the smaller molecular component is held so tenaciously that it can only partly be removed by heating in a high vacuum for several days. This concept was introduced by these observers as the "choleic acid principle," which not only eliminated the previous incongruities concerning these bile acids but confirmed the earlier observations of other investigators who had noted the tenacity with which fatty acids are retained whenever purification of bile acids is attempted.

Sobotka² pointed out that the significance of this principle for the theory of intestinal resorption is obvious and that this peculiarity of deoxycholic acid to form coordination compounds is shared only to a limited extent by other bile acids. Boedecker and Volk³ discovered, however, that alpha and beta apocholic acids form coordination compounds very similar to the choleic acids with deoxycholic acid. This additional evidence that the ability of deoxycholic acid to form coordination compounds is shared to an equal extent by apocholic acid is more recently recognized by Sobotka.⁴ This author states that it should be kept in mind that animal bile contains conjugated bile acids and that no choleic acids with conjugated bile acids have been isolated. He points out, however, that the conjugated bile acids as found in animal bile share the ability of the free acids of keeping water-insoluble substances in solution and, owing to their greater acidity, retain this dissolving power even in slightly acid reaction down to pH 6. The latter is significant when it is realized that the contents of the proximal portion of the intestinal tract have a slightly acid reaction.

Wieland and Revery⁵ have shown that deoxycholic acid is present in the bile of man and Sobotka,⁶ that it is present to greater or lesser extent in the bile of other animals. The latter has also indicated that absorption of ingested cholesterol and of cholesterol excreted by the intestinal mucosa requires the presence of bile.

Numerous studies have been made to show the effect of various bile acids on the solubility and absorption of cholesterol. Schoenheimer,⁷ by analysis of intestinal residue in mice and by appearance of lipemia in rabbits, found that the absorption of cholesterol and fats was hastened by the ingestion of deoxycholic acid. Diffusion experiments by Schoenheimer and Hrdina⁸ and by Spanner and Bauman⁹ demonstrate a stronger association of cholesterol with deoxycholic acid than with any other bile acid. The latter investigators,⁹ by the Windaus procedure, have shown that the solubility of cholesterol is about four times as great in a 3 per cent solution of the sodium salt of deoxycholic acid as in the same strength solution of the sodium salt of cholic, taurocholic or glycocholic acid. Andrews and the former investigators¹⁰ have indicated that the faculty of deoxycholic acid to hold cholesterol in solution seems to be also dependent on its ability to form addition compounds with cholesterol.

Bashour and Bauman¹¹ have reported additional data to confirm the greater effect of sodium deoxycholate on the solubility of cholesterol as compared to sodium cholate and the conjugated bile salts. They point out that the differences between conjugated and unconjugated salts appear to be purely quanti-

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2. Sobotka, H.: *The Chemistry of the Bile Acids and Related Substances*, Chem. Rev. **15**:311 (Dec.) 1934.

3. Boedecker, F., and Volk, H.: *Ber. d. Deutschen chem. Gesellschaft*, **52**:1852, 1920; **54**:2302, 1921.

4. Sobotka, Harry: *The Chemistry of the Steroids*, Baltimore, Williams & Wilkins Company, 1938, p. 128.

5. Wieland, H., and Revery, G.: *Untersuchungen über die Gallensäuren*, XXI. Zur Kenntnis der menschlichen Galle, *Ztschr. physiol. Chem.* **140**:186, 1924.

6. Sobotka, H.: *Physiological Chemistry of Bile*, Williams and Wilkins Co., Baltimore, 1937, pp. 119, 125.

7. Schoenheimer, R.: *Increasing Cholesterol Absorption with Deoxycholic Acid*, *Bio. Ztschr.* **147**:258, 1924.

8. Schoenheimer, R., and Hrdina, L.: *Etiology of Gallstones*, I. Chemical Factors, *Proc. Soc. Exper. Biol. & Med.* **25**:944, 1931.

9. Spanner, G. O., and Bauman, L.: *The Behavior of Cholesterol and Other Bile Constituents in Solutions of Bile Salts*, *J. Biol. Chem.* **98**:181, 1932.

10. Andrews, E.; Schoenheimer, R., and Hrdina, L.: *Chemical Factors and the Role of the Gallbladder: Etiology of Gallstones*, *Arch. Surg.* **25**:796 (Oct.) 1932.

11. Bashour, J. T., and Bauman, L.: *The Solubility of Cholesterol in Bile Salt Solutions*, *J. Biol. Chem.* **121**:1 (Oct.) 1937.

tative, the latter being better solvents. Colp and Doubilet¹² have demonstrated the presence of large amounts of deoxycholic acid in human bile but Doubilet¹³ has shown that in man the administration of cholic acid is more effective than the administration of deoxycholic acid in raising the concentration of bile acids in hepatic bile. Most of the studies of the effects of bile acids on the solubility of cholesterol have been made in connection with the theory of gallstone formation and are therefore of significance from the standpoint of intestinal absorption only to the extent that cholesterol is similar to fat-soluble vitamins and fats.

The effect of various bile acids on the absorption of fats from the intestinal tract was previously studied by Pohl.¹⁴ The comparative figures obtained by this investigator for the absorption of fat from the intestines of rabbits are 1.22 for sodium cholate and 1.7 for deoxycholic acid, indicating that the latter was 39 per cent more effective than sodium cholate.

Greaves and Schmidt¹⁵ have reported evidence to indicate that bile salts are necessary for the intestinal absorption of B-carotene (precursor of vitamin A) and vitamins D and E. This evidence indicates that deoxycholic acid, not taurocholic, glycocholic or dehydrocholic acid, is responsible for the absorption of B-carotene. Ivy and Berman¹⁶ point out that such clearcut information is not available in the case of vitamins D, E and K. These investigators state that a sufficient amount of comparative evidence does not exist at present for them to state which preparations of bile or bile salts are better for oral therapy. They indicate that while the argument that the salts of oxidized bile acids are preferable to the unoxidized bile acids for oral therapy because the oxidized bile acids show less systemic toxicity may be partly true, this has not been established by *in vivo* experimentation. Dehydrocholic acid is said not to facilitate the action of lipase like most other bile acids.

Crandall and Ivy¹⁷ have recently reported that a marked rise in blood fat occurs in dogs with "internal" biliary fistulas two to five hours after a meal of olive oil when given with 3 Gm. of commercial bile salts, deoxycholic acid or taurocholic acid. No rise occurs without bile salts or with dehydrocholic, cholic and glycocholic acids. Irvin, Kopla and Johnston¹⁸ have reported the results of photoelectric colorimetric determinations of the provitamin, carotene, in the contents of isolated intestinal loops of dogs before and after absorption periods. They find that a concentrated solution of carotene in cottonseed oil is not absorbed without bile and pancreatic lipase, but when given with hog or ox bile, significant amounts are absorbed, and these are greater when pancreatic lipase is added. Sodium deoxycholate is indicated to be the most effective bile salt for this purpose, but the cholate and glycocholate are also found to be effective.

Rhoads¹⁹ finds that deoxycholic acid is present in ox bile salts, usually from 10 to 20 per cent. The latter reports 14 cases of jaundice with prothrombin deficiency in which desiccated ox bile, iron ox bile salts, dehydrocholic acid and sodium deoxycholate were effective in appropriate dosage with vitamin K; sodium deoxycholate probably the most effective per unit of weight. Similar bile salt preparations were found to be effective with vitamin K in most cases of jaundice by Butt,

Snell and Osterberg.²⁰ They indicate that, in patients with primary hepatic damage, prothrombin deficiency occasionally fails to respond to large doses of vitamin K administered orally with bile salts or given intramuscularly. These authors did not note comparative effectiveness in the bile preparations used.

The successful use of bile salts with oral vitamin K in the treatment of prothrombin deficient hemorrhagic states in which there is lack of intestinal bile is also reported by Warner, Brinkhaus and Smith²¹ and by Pohle and Stewart²²; Ravdin²³ obtained similar results by the use of a crude preparation of vitamin K and sodium deoxycholate or lyophilic bile. In a recent report of the Council on Pharmacy and Chemistry²⁴ it is pointed out that the response of prothrombin deficient patients to intramuscular administration of vitamin K is distinctly less rapid than that which follows oral administration and that the former method has no apparent advantage over the latter except when the jaundiced individual may be unable to take or absorb the vitamin by mouth. The usefulness of bile salts with vitamin K in prothrombin deficiency states when failure to absorb the vitamin is due to lack of intestinal bile appears to be adequately supported by published evidence.

SUMMARY

Consideration of the available published evidence indicates that bile salts are apparently essential for the intestinal absorption of fat-soluble vitamins as well as food fats. Evidence that any one particular bile acid or its salt is essential for the intestinal absorption of all or certain fat-soluble substances is less convincing, except possibly in the case of deoxycholic acid for B-carotene, which needs further confirmation. While there is some chemical and experimental evidence to suggest that deoxycholic acid may be the most efficient bile acid in the transport of fatty compounds across the intestinal mucosa further controlled animal and human studies to furnish corroborative *in vivo* evidence of this possibility are necessary. Existing clinical evidence does not establish the relative efficiency of the various bile acids with respect to the intestinal absorption of fats or fat-soluble compounds. There is evidence to indicate that deoxycholic acid is one of the most toxic of the bile acids, although the toxicity of bile acids when given orally is of much less importance than when given parenterally. Clinical evidence thus far available does not indicate that orally administered deoxycholic acid produces untoward effects even in amounts somewhat larger than the recommended dosage. It is believed that the use of officially recognized bile salt preparations is more rational for the purpose of promoting the absorption of fats and the fat-soluble vitamins at the present time. In the meantime, the development of further studies to indicate what difference in absorptive activity, if any, is possessed by the various bile acids is awaited with interest. The use of chemically pure bile acid or salt compounds as opposed to impure preparations or mixtures is desirable when there is evidence to indicate that the former function equally well.

The Council recognized the term "Degalol" as the firm's proprietary name for its brand of deoxycholic acid on the basis that the firm was the first to make the product commercially available in this country. The Council voted, however, that consideration of Degalol (Riedel de-Haen, Inc.) and the dosage form, Degalol Tablets, 1½ grains, be postponed because the evidence for its value is not sufficient to warrant acceptance of the product at this time.

12. Colp, R., and Doubilet, H.: Differential Analysis of Bile Acids in Human Bile, *Am. J. Surg.* 33:913 (Dec.) 1936; Doubilet, H., and Colp, R.: Analysis of Bile Acids in Human Bile from Fistula, *ibid.* 33:7.

13. Doubilet, H.: in *Man of the Various Bile Acids Following Their Oral Administration*, Proc. Soc. Exper. Biol. & Med. 36:50 (Feb.) 1937.

14. Pohl, J.: The Physiologic Action of Bile Acids, *Ztschr. f. d. ges. exper. Med.* 30:423, 1922.

15. Greaves, J. D., and Schmidt, C. L. A.: Role Played by Bile in the Absorption of Vitamin D in the Rat, *J. Biol. Chem.* 102:101, 1933; On the Absorption and Utilization of Carotene and Vitamin A in Cholelithotomized Vitamin A Deficient Rats, *Am. J. Physiol.* 111:492 (April) 1935; Relation of Certain Bile Acids to Absorption of B-Carotene in the Rat, Proc. Soc. Exper. Biol. & Med. 36:434 (May) 1937; Relation of Bile to Absorption of Vitamin E in the Rat, *ibid.* 37:40 (July) 1937.

16. Ivy, A. C., and Berman, A. L.: The Rationale of Bile Salt Therapy in Biliary Tract Disease, *Minnesota Med.* 22:815 (Dec.) 1939.

17. Crandall, L. A., and Ivy, H. B.: Bile Salts and Fat Absorption, *Abstr. Rev. Gastroenterol.* 7:300 (May-June) 1940.

18. Irvin, J. L.; Kopla, J., and Johnston, C. G.: *Am. J. Physiol.* 132:202 (Feb.) 1941.

19. Rhoads, J. E.: The Relation of Vitamin K to the Hemorrhagic Tendency in Obstructive Jaundice, with a Report on Cerephyl as a Source of Vitamin K, *Surgery* 5:794 (May) 1939.

20. Butt, H. R.; Snell, A. M., and Osterberg, A. E.: Further Observations on the Use of Vitamin K in the Prevention and Control of the Hemorrhagic Diathesis in Cases of Jaundice, Proc. Staff Meet., Mayo Clin. 13:753 (Nov. 30) 1938; The Preoperative Administration of Vitamin K to Patients Having Jaundice, *J. A. M. A.* 113:383 (July 19) 1939.

21. Warner, E. D.; Brinkhaus, K. M., and Smith, H. P.: Bleeding Tendency of Obstructive Jaundice: Prothrombin Deficiency and Dietary Factors, Proc. Soc. Exper. Biol. & Med. 37:628 (Jan.) 1938; Brinkhaus, K. M.; Smith, H. P., and Warner, E. D.: Prothrombin Deficiency and the Bleeding Tendency in Obstructive Jaundice and in Biliary Fistula: Effect of Feeding Bile and Alfalfa (Vitamin K), *Am. J. M. Sc.* 106:50 (July) 1938.

22. Pohle, F. J., and Stewart, J. K.: Observations on Plasma Prothrombin and Effects of Vitamin K in Patients with Liver or Biliary Tract Disease, *J. Clin. Investigation* 19:365 (March) 1940.

23. Ravdin, I. S.: Some Recent Advances in Surgical Therapeutics, *Ann. Surg.* 109:321 (March) 1939.

24. Preliminary Report on Vitamin K: *H. J. A. M. A.* 113:207 (Dec. 2) 1939.

REPORT OF THE COUNCIL

FOILLE (CARBISULPHOIL COMPANY) NOT
ACCEPTABLE FOR N. N. R.

At the request of the Council, the Carbisulphoil Company of Dallas, Texas, submitted under the name "Foille" an emulsion for use as a new protective antiseptic and analgesic dressing in the local treatment of recent and infected burns, traumatic and infected wounds, and indolent ulcers. The product is stated to consist of the following ingredients:

	Approximate Percentage
Alcohol	1.20
Phenol	2.36
Benzocaine	1.26
Calcium soap	0.36
Calcium iodide	0.24
Potassium iodide	0.12
Oxyquinoline base	0.18
Calcium thiosulfate	0.03
Calcium sulfite	0.07
Calcium sulfate	0.13
Sulfur (free)	0.17
Water	2.85
Corn Oil (fixed)	90.33
Glycerin	present

The method of preparation described by the manufacturer involves the use of corn oil, Sulfuretted Calcium Solution, N. F., Phenol, U. S. P. (liquefied by addition of 10 per cent water), Tincture of Iodine, U. S. P., benzocaine and 8-hydroxyquinoline. In proof of the composition of Foille, chemical analyses from two laboratories were submitted. The A. M. A. Chemical Laboratory found the composition to be essentially that claimed.

In reply to numerous inquiries resulting from the wide promotion of Foille as "The New-Type Treatment for Burns," the Council's office has called attention to a somewhat similar product previously considered by the Council, which was submitted in 1929 under the name "Carbisulphoil" by the Globe Laboratories of Fort Worth, Texas. The manufacturer of this product stated that it was supplied in two strengths: "Carbisulphoil Medicine No. 2," prepared by incorporating 2 per cent of 30 per cent phenol, 2 per cent of tincture of iodine, U. S. P., and 2 per cent of sulfuretted lime, N. F., with corn oil; and "Carbisulphoil Medicine No. 4," prepared by adding 4 per cent of each of these ingredients to corn oil instead of 2 per cent. It was claimed to be therapeutically indicated for surgical dressings, cuts, wounds, bruises, burns, ulcers, piles and gonorrheal infections in male and female. The Council declared Carbisulphoil unacceptable for N. N. R. because it was an unscientific mixture of indefinite composition marketed with unwarranted claims. Subsequently the Globe Laboratories submitted a chemical analysis of composition of Carbisulphoil No. 2 and No. 4 as follows:

Sample No. 2		Sample No. 4	
Potassium iodide.....	0.1%	Potassium iodide.....	0.2 %
Calcium iodide.....	0.3%	Calcium iodide.....	0.4 %
Calcium thiosulfate.....	0.1%	Calcium thiosulfate.....	0.2 %
Calcium tetrathionate.....	0.2%	Calcium tetrathionate.....	0.03%
Soap (insoluble).....	0.2%	Soap (insoluble).....	0.47%
Sulphur (free).....	0.3%	Sulphur (free).....	0.9 %
Ethyl alcohol.....	1.5%	Ethyl alcohol.....	3.0 %
Phenol.....	1.6%	Phenol.....	3.2 %
Vegetable oil.....	94.0%	Vegetable oil.....	88.0 %
Water.....	1.7%	Water.....	3.6 %
Glycerin.....	trace	Glycerin.....	trace

After further consideration the Council voted to postpone publication of its report to await further evidence from the firm, provided there was no exploitation of the product beyond giving out experimental supplies to selected physicians. The Globe Laboratories later wrote that because of its inability to make the product acceptable it would neither manufacture nor sell the preparation in the future. The Council, therefore, never published its report, declaring Carbisulphoil unacceptable for New and Nonofficial Remedies.

The Carbisulphoil Company has disclaimed that Foille is essentially the same as its predecessor Carbisulphoil (Globe Laboratories) on the ground that the process of manufacture and therapeutic indications are different for Foille and that Carbisulphoil was an evil-smelling, unstable product and has expressed the view that it is prejudicial to compare the two products. The Council desires to point out, however, that although Foille apparently differs in certain respects from Carbisulphoil it consists, nevertheless, of an even greater number

of ingredients, all except two of which are essentially identical with those of its predecessor. From the preceding analyses it will be noted that Foille differs essentially in composition from Carbisulphoil only by the addition of oxyquinoline sulfate and benzocaine. The Council believes it only fair to indicate the points of similarity of Foille and Carbisulphoil in order to show that the former is not an entirely new type of preparation advanced for the treatment of burns.

The manufacturer claims that Foille is not a definite pharmaceutical mixture nor a chemical entity but that its ingredients are suspended in an emulsion and that they are not more numerous than those in other mixtures accepted by the Council. It is promoted as a new and more efficient treatment for burns. The benzocaine plus the phenol is said to effect an immediate and pronounced anesthesia which mitigates shock and pain to provide a distinctly favorable factor in the initial stage of a serious burn. The action of the soap augmented by phenol on prolonged contact is claimed to coagulate the serum exudation, excluding air and forming a soft shield. It is also claimed that the coagulation does not rigidly seal over the burned tissues and permits moderate immediate separation. The oxyquinoline base is stated to provide an efficient bacteriostatic and antiseptic action and to supply stimulation of granulation. The iodide salts are claimed to have a definite therapeutic effect. The claim is made that the potassium iodide is absorbed easily from wound surfaces and that the employment of alkaline iodides is based on empirical foundation. The firm quotes Poulsson, Bastedo, Sollmann and Zwick on the iodides, on which basis the claim is made that iodides may be expected to promote catabolism of the diseased cells and thereby accelerate the healing process. The firm expresses the belief that the iodides in Foille are, to an appreciable degree, partly responsible for the evidence of speedier granulation and epithelization and the pronounced efficiency in treating infected burns and indolent ulcers. However, no convincing evidence has been shown in support of such action by these agents.

In support of its claims for the product the manufacturer submitted F. D. A. Agar Cup Plate tests from three laboratories to indicate the antiseptic action of Foille on *Staphylococcus aureus* and certain fungi, and additional laboratory statements to show that poisoning from the phenol contained in the product will not occur because it is not appreciably absorbed through the skin because of its affinity for the water-in-corn oil vehicle and that a mild antiseptic action occurs with prolonged application. Bacteriologic examination of the product by a consultant of the Council indicates that Foille exhibits a distinct inhibitory effect on staphylococci and no inhibitory effect on *B. coli* on plain agar cups, and that it is impossible to say whether such inhibitory effects occur in the case of infected wounds, because a bacteriologic study of them would be difficult to accomplish on account of the nature of the product. It was suggested that clinical tests should be made with controls of Foille in which phenol, oxyquinoline sulfate and the iodides have been omitted. The inhibitory effects of Foille on staphylococci must be accounted for on the basis of its content of phenol and oxyquinoline sulfate, both of which are known to have fair bacteriostatic qualities.

In further support of its claims, the manufacturer submitted 75 case histories and statements (mostly testimonials) from physicians, exhibits of serial photographic human and animal studies, four medical papers, a hospital study compiled by the City-County Hospital, Fort Worth, Texas, three statements by hospital executives, and lists of industrial and other institutions, clinics and hospitals employing Foille. Much of this material appears in a large illustrated advertising brochure entitled "Foille, the New-Type Treatment for Burns" distributed by the manufacturer.

The twenty-two physicians whose case reports appear in the advertising brochure were requested by the Council office to indicate whether or not these reports represented their present views concerning Foille and whether or not they had done any controlled work. In most instances the replies which were received admitted that no controlled work had been done, and such additional information as was given is largely testimonial and does not constitute evidence to establish the claims made for the product. The two series of photographic animal studies submitted partially illustrate the results reported in the paper

by Terrell,¹ reprinted in the firm's advertising brochure. The paper indicates the comparative effects of Foille and 10 per cent tannic acid in the treatment of equally extensive cautery burns in 4 dogs, and toxicity tests of Foille by application to cautery burns and by oral administration in another 4 dogs for a period of twenty-two days. The 2 Foille-treated dogs were stated to be more comfortable and to show more rapid healing than the two tannic acid-treated animals; necropsy of the other four dogs showed only petechiae in the small intestine of the two externally tested animals and no evidence of toxic effects in the two orally tested dogs.

The second medical paper, by Galt,² points out that Underhill has rather conclusively proved that toxemia in burns is not due to absorption of products from the burned areas. Apparently this is intended as an argument in favor of the use of Foille as an antiseptic and presumably refers to the previous reports by Underhill and his co-workers,³ who showed that early toxic symptoms are due to dehydration, increased concentration of the blood and loss of blood chlorides and serum protein. These investigators concluded that an elevation of temperature after the first twenty-four to thirty-six hours is not the result of any absorption of decomposed protein from the burned areas but is caused by infection. This appears to emphasize the need for aseptic precautions and general measures to combat dehydration, rather than a recommendation for the use of a local antiseptic oil such as Foille. Kapsinow⁴ has shown experimentally by injection of dyes and lethal doses of strychnine into the burned areas that no absorption from these areas occurs within the first twenty-four to thirty-six hours. While such studies have cast considerable doubt on the toxic theory advanced by Davidson⁵ for the use of tannic acid, the results obtained from local use of escharotics in the treatment of burns are still regarded favorably by many investigators. The invalidation of the theory that decomposed protein absorbed from burned areas produces shock simply minimizes the importance of local treatment and does not discredit the principles of systemic treatment to combat burn shock, when this is present, from whatever cause.

A third paper, by Dr. Samuel Webb Jr., read before the Northeast Medical Society on Oct. 10, 1939, simply gives this author's experiences with the use of Foille over a period of eighteen months. Most of the statements made represent personal impressions.

The fourth paper, by Nagel,⁶ represents a single case report, which is not adequate to support the author's conclusion that Foille represents an advance in the treatment of major burns. A recently published paper by Noland and Wilson⁷ includes photographs of burns to show the results of local treatment with Foille but does not furnish adequate evidence to justify the conclusions made by the authors.

The submitted hospital study reports two groups of burned patients: one group of 20 treated with various types of remedies other than Foille, and another group of 20 treated with the latter. The Foille-treated patients were stated to show marked comfort and reduction in contracture, scarring and infection, and to require comparatively less opiates, sedatives, dressings and hospitalization than patients receiving other types of treatment. From the data given a conclusion is difficult to draw, since burns vary in degree as well as in extent. The submitted statements of hospital executives furnish no actual evidence, and the submitted lists of organizations and physicians employ-

ing Foille represent a brief in support of the manufacturer's ability to sell the product rather than proof of its value as a therapeutic agent.

The Council considered an unpublished controlled clinical report made by Dr. Joseph E. Hamilton and Dr. Arnold Griswold on the effects of Foille and tannic acid in the treatment of alternate patients with comparable burns at the Louisville City Hospital, Louisville, Ky. The series of cases comprised 42 patients treated with Foille and 36 treated with tannic acid. These investigators found no evidence of toxicity from the phenolates or other constituents of Foille. They found no essential difference in the control of traumatic shock other than that Foille permitted more initial exudation than did tannic acid and did not seem as efficient as a good tannic acid eschar in relieving pain in the first few days (acute stage) of the burn. No detectable difference in the effect on toxemia was evident. They found that the Foille-treated lesions were less septic than those treated by tannic acid and that, because the soft coagulum produced by Foille may be easily removed with tub baths, its repeated application in the granulating stage of deeper burns was less painful than when tannic acid had been employed. In the more superficial burns, which did not require skin grafting, the tannic acid eschar necessitated less trouble and nursing care in many cases for which no further treatment was necessary. It was also found that the use of Foille in deeper burns permitted earlier skin grafting and apparently had no injurious effect on freshly implanted pinpoint grafts. Scarring and contracture in deep second and third degree burns was somewhat less with Foille; and the hospital stay, although slightly reduced, was not remarkably less than for tannic acid-treated burns.

The Council also gave consideration to reports on the use of other agents employed in the local treatment of burns. Bettman⁸ has modified the original tannic acid treatment of Davidson by applying silver nitrate (10 per cent) following an initial application of tannic acid (5 per cent) after all loose skin from opened blebs is removed and believes that this treatment shortens the period for production of an eschar. The eschar produced is unusually firm and impermeable, which is said to prevent edema beneath it, thereby avoiding embarrassment of the circulation and preventing the entrance of infection. Bettman says "As stated earlier, red blood cells and albumin do not occur in the urine of patients under the tannic acid-silver nitrate regimen in the absence of applications of grease or oil; but, when these applications have been made, there is always albumin in the urine, even though an attempt has been made to remove them." He believes that the slight surface moisture produced by oils is enough to permit the entrance into the blood stream of toxins or other elements that are present on the surface and to allow some infection to develop. The factor of dryness seems to be stressed, especially in connection with infection. He states further, "Burns treated with oil and grease heal slowly, become infected, form abundant scar tissue and have a long and trying period of hospitalization."

Blackfield and Goldman⁹ are in agreement with the idea of production of a dry eschar in the shortest possible time to prevent infection, and they favor the use of the aseptic tannic acid bath previously described by Wells. They emphatically condemn the use of unguents, which is stated to be a type of initial treatment that may interfere with modern therapy. The tannic acid bath is followed with 10 per cent solution of silver nitrate to produce an immediate tan. The tanned areas, including edges, are then treated with applications of 1 per cent aqueous solution of gentian violet several times daily to keep the eschar dry and prevent infection. They regard their method as the one of choice in the early local treatment of burns. Although they avoid rigid eschar formation because of the danger of constriction of circulation in burns encircling the extremities, they do not recommend the use of oily preparations. Meyer and Wilkey¹⁰ reported 968 burn cases in the Cook County Hospital, Chicago, treated by different methods. Of

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2. Galt, Sidney: The Use of Foille in the Treatment of Burns, *Dallas M. J.* 25: 81 (July) 1939.

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5. Davidson, E. C.: Tannic Acid in the Treatment of Burns, *Surg., Gynec. & Obst.* 41: 202 (Aug.) 1925.

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7. Noland, Lloyd, and Wilson, C. H.: More Recent Ideas in the Treatment of Burns, *J. M. A. Alabama* 10: 157 (Nov.) 1940.

8. Bettman, A. C.: The Rationale of Tannic Acid-Silver Nitrate Treatment of Burns, *J. A. M. A.* 108: 1490 (May) 1937.

9. Blackfield, H. M., and Goldman, Leon: Burns in Children, *J. A. M. A.* 112: 2235 (June 3) 1939.

10. Meyer, K. A., and Wilkey, J. L.: Modern Treatment of Burns, *Minnesota Med.* 21: 644 (Sept.) 1932.

272 patients treated with 5 per cent tannic acid aqueous solution, 34 died and 108 showed infection; 104 patients with second and third degree burns were treated with Aldrich's compound aniline dye mixture (by weight: gentian violet 3 parts, brilliant green 2 parts, neutral acriflavine 1 part), with a mortality of 8.7 per cent and infection in only 10 cases; 125 patients with second degree burns were treated with 1 per cent aqueous solution of gentian violet only, with 1.6 per cent mortality and infection in 22 patients; 220 patients with severe second and third degree burns were given Bettman's tannic acid-silver nitrate treatment followed by application of scarlet red to unhealed areas after removal of the crust, with a mortality of 8.6 per cent and infection in only 18 cases; 26 patients with second degree burns of the extremities received the silver nitrate-methyl rosaniline dye local treatment, with no deaths and only 2 cases of infection; 38 patients with inextensive first and second degree burns were treated with crude cod liver oil applications after cleansing, with no deaths; but, with the second degree burns, infection occurred in 8 cases and delayed healing occurred in many instances, and 186 patients with contaminated burns received local saline and boric acid dressings, plus, in many cases, 3 per cent xeroform (tribromphenol plus bismuth) treated sterile petrolatum gauze strips, with only 0.6 per cent mortality (2 deaths). The authors conclude that the Bettman tannic acid-silver nitrate treatment is the local therapy of choice in uncontaminated or noninfected severe burns not more than 12 hours old. They believe the aniline dye treatment is better after infection is imminent; and, most important, the general treatment of initial shock, plus good nursing care, should take precedence over the local therapy.

McClure¹¹ has recently reported the method employed at Henry Ford Hospital, Detroit, in the management of severe burns. He also presents an excellent review of the accepted methods of treatment, emphasizing the subjugation of local therapy for attention to threatening toxemia, alterations in blood chemistry, a wound very susceptible to infection and pathologic changes in organs remote from the skin. He indicates that the original toxin-absorption theory is not yet settled but points to recent evidence corroborating the early observations that liver necrosis occurs in fatal cases of burns.¹²

The Council's referee desires to emphasize that there are certain physiologic and pathologic processes in connection with burns which require something more than the local application of a "shotgun" soap preparation. Trusler, Egbert and Williams¹³ have recently pointed out that the late symptoms of pulmonary edema, emesis, hyperpyrexia, progressive anasarca, convulsions, coma and circulatory collapse which occur after a severe extensive burn, have been falsely ascribed to toxemia and are more probably the result of disturbance in water balance which occurs when fluids are forced and the tissues become waterlogged by fluid loss through the injured capillaries. They emphasize the importance of maintenance of fluid balance and the use of blood and plasma transfusions and moderate amounts of other fluids, with large amounts of dextrose and oxygen, in the treatment of severe burns.

SUMMARY

The evidence submitted by the firm to support the claims for Foille is largely testimonial, poorly, if at all, controlled and consists of considerable reduplication of material. The case reports submitted are further inadequate from the standpoint of blood studies by which to evaluate the systemic condition of the patients. The reported experiments on 4 dogs to determine the toxicity of Foille and mere clinical statements based on negative evidence to the contrary cannot be regarded as adequate. Aside from the question of systemic absorption the possible danger of local injury to tissues by the action of 2.35 per cent phenol should be considered. In view of the bacteriologic laboratory evidence, the firm's claim that the product is antiseptic should be modified; and it is pointed out

that this factor cannot be evaluated in the absence of comparative clinical studies using control preparations of Foille in which phenol, oxyquinoline sulfate and the iodides are omitted. The Council believes that such controlled evidence is essential to establish any therapeutic rationale for the large number of ingredients contained in Foille and, by corollary, that the available evidence constitutes no real proof of the firm's claim that the so-called active ingredients all have a therapeutic effect. As has already been pointed out, the pain-controlling effect of Foille is not surprising in view of its phenol and benzocaine content, and the results reported do not appear remarkable or essentially different from those which might be expected with the use of other local agents.

Reports in the literature indicate that the choice of local therapy in the treatment of burns depends on the degree and type of involvement; that the initial use of oily preparations, if not actually harmful, may be detrimental to the use of the more commonly employed escharotic agents in severe burns; and that the treatment of the systemic reactions accompanying severe burns is probably of greatest importance. Available evidence indicates that the use of tannic acid-silver nitrate-antiseptic dye preparations for the production of a firm protective eschar is most widely accepted in the local treatment of severe burns at the present time, irrespective of which of the theoretical factors—absorption of split protein, loss of serum (dehydration) or infection at the site of burn—is mainly responsible for the grave systemic reactions which occur.

The Council does not wish to discourage scientific laboratory and clinical investigation from developing a more efficient local agent for use in the treatment of extensive burns; but in view of the conflicting evidence at the present time it is unwilling to accept a partially antiseptic, complex, oily soap emulsion possessing anesthetic properties for use in the local treatment of burns, wounds and chronic ulcers. The meaningless proprietary name Foille and the inclusion of iodides, or other ingredients, in its formula on an empirical basis are in conflict with the Council's rules. It is believed that more rigidly controlled comparative clinical investigations are necessary to determine not only which, if any, of the ingredients in the product are responsible for its claimed effectiveness in certain cases, but also definitely to establish whether or not the results obtained are essentially different from those secured with other preparations. Not only should cases of approximately equal severity be selected for such studies, but systemic treatment must also be kept as nearly uniform as possible. Control of pain by the administration of opiates or other analgesics in those cases not treated with a local anesthetic preparation should be done to eliminate this factor. Whether or not the addition of anesthetic substance to local agents for burns may obviate the use of opiates appears to depend on evidence to prove the harmlessness and value of viscous oily vehicles, since only in such a medium would the anesthetic be kept in contact with the surface for a sufficient length of time to exert more than transient effects. It is emphasized that the Council's principal objection to Foille, aside from the name, is not primarily that it consists of a large number of ingredients but that there is lack of evidence to establish the therapeutic rationale for a preparation of such complexity. The burden of proof to substantiate the claims made for the product lies with the firm.

The foregoing report (now slightly modified) was transmitted to the manufacturer. It has replied that additional control studies are being set up in several hospitals to obtain the further evidence required by the Council and requested that publication of its report be postponed until more evidence could be obtained. The manufacturer was asked to withdraw active promotion of Foille pending the accumulation of satisfactory evidence of its value, but it has indicated that it is unwilling to do so. Under its procedure, the Council is therefore obliged to publish this statement of its consideration of Foille.

The Council voted that Foille (Carbisulphoil Company) be not accepted for inclusion in New and Nonofficial Remedies because it is marketed under an uninformative proprietary name without satisfactory evidence to establish the therapeutic rationale for its complex formula and the claims made for it.

11. McClure, R. D.: The Treatment of the Patients with Severe Burns. *J. A. M. A.* 113: 1808 (Nov. 11) 1939.

12. Belt, T. H.: *J. Path. & Bact.* 48: 493 (May) 1939.

13. Trusler, H. M.; Egbert, H. L., and Williams, H. S.: Burn Shock: Water Intoxication as a Complication. *J. A. M. A.* 113: 2207 (Dec. 16) 1939.

Council on Foods and Nutrition

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
FRANKLIN C. BING, Secretary.

INGREDIENTS FOR USE BY BAKERS FOR IMPROVING THE NUTRITIONAL VALUE OF BREAD

The Council has encouraged the restorative addition of essential vitamins and minerals to processed foods in order to facilitate the selection of diets that are adequate for optimal health. The nutritional value of bread can be improved by the use either of specially milled flours which contain the major portion of the vitamin and mineral content of the grain with a minimum of coarse bran derived from the outer branny coats or of white flour to which an appropriate mixture of crystalline vitamins (or vitamin concentrates) and mineral salts has been added by the miller. Another satisfactory procedure is the addition by the baker of a suitable vitamin and mineral mixture to the ordinary white flour used in preparing the bread dough. Some considerations involved in the selection of an appropriate vitamin and mineral mixture have been discussed in the Council's report on "Nutritionally Improved or Enriched Flour and Bread."¹

The following product has been declared accepted by the Council as a convenient preparation for use by bakers for increasing the thiamine, riboflavin, nicotinic acid, iron and calcium contents of ordinary white flour to be used in making "Enriched Bread." Standards for "Enriched Bread" have been suggested and will be discussed at hearings of the Food and Drug Administration to be held in Washington during 1941.

ACCEPTED FOODS

THE FOLLOWING ADDITIONAL FOODS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO ACCEPTED FOODS.

FRANKLIN C. BING, Secretary.

FOODS FOR SPECIAL DIETETIC PURPOSES (See Accepted Foods, 1939, page 295).

General Mills, Inc., Minneapolis.

VIBIC BREAD INGREDIENT, a mixture of cornstarch, thiamine hydrochloride, riboflavin (or its concentrate), nicotinic acid, calcium sulfate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) and iron phytate. This product is designed for use by commercial bakers as a nutritional ingredient in bread doughs.

Analysis (submitted by manufacturer).—Moisture 12.8%, total solids 87.2%, ash 23.3%, protein ($N \times 5.7$) 4.8%, fat (ether extract) 0.2%, crude fiber 0.3%, carbohydrates other than crude fiber (by difference) 58.6%, calcium (Ca) 5.4%, iron (Fe) 0.66%.

According to reports of thiochrome (Hennessy-Cerecedo method²) assay this product contains 310 international units of thiamine per gram, 420 mg. per pound. According to reports of microbiologic (Snell and Strong method³) assay this product contains 210 mg. of riboflavin per pound. This product contains 1,230 mg. of nicotinic acid, 3,000 mg. of iron (Fe) and 24,000 mg. of calcium (Ca) per pound. When Vibic bread ingredient is used at the rate of 0.5 per cent in a bread formula ($\frac{1}{2}$ pound of Vibic ingredient to 100 pounds of flour) the resulting bread will contain 1.4 mg. of thiamine, 4.0 mg. of nicotinic acid, 0.8 mg. of riboflavin, 11.8 mg. of iron (Fe) and 132 mg. of calcium (Ca) to the pound loaf.

The following product has been declared accepted by the Council as a specially milled flour to be used by bakers in the preparation of "Enriched Bread." Bread made with this flour has a texture similar to white bread, a uniform light brown color and a characteristic flavor. Such bread will meet the

standards for thiamine, riboflavin, nicotinic acid and iron contents which have been suggested for "Enriched Bread" and which will be discussed at hearings of the Food and Drug Administration to be held in Washington during 1941.

VIBIC BREAD FLOUR, a mixture of bleached white flour from hard wheat, definite proportions of flours prepared from selected layers of the wheat kernel, riboflavin (or its concentrate), nicotinic acid, calcium sulfate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) and iron phytate.

Analysis (submitted by manufacturer).—Moisture from 13.0 to 14.5%, ash (added mineral compounds excluded) not exceeding 1%, fat (ether extract) approximately 2.0%, protein ($N \times 5.7$) from 12.5 to 14.0%, total carbohydrates other than crude fiber (by difference) approximately 70.0%, crude fiber approximately 0.5%, calcium (Ca) 0.045%, iron (Fe) 0.004%.

According to reports of thiochrome (Hennessy and Cerecedo method²) assay this product contains not less than 1.75 international units of thiamine per gram, 2.4 mg. per pound. According to reports of microbiologic (Snell and Strong method³) assay this product contains not less than 1.2 mg. of riboflavin per pound. This product contains nicotinic acid added in amounts sufficient to produce a total content of nicotinic acid of not less than 6.15 mg. per pound. Bread made with this flour will contain 1.4 mg. of thiamine, 4 mg. of nicotinic acid, 0.8 mg. of riboflavin, 11.8 mg. of iron (Fe) and 132 mg. of calcium (Ca) per pound loaf.

Calories.—3.53 per gram; 100 per ounce.

Orpro Food Products, Los Angeles.

ORPRO WITH ADDED VITAMINS B₁ (THIAMINE) AND G (RIBOFLAVIN), bottled, concentrated apple juice prepared from Rome Beauty, Delicious and Winesap apples; containing added crystalline vitamins B₁ (thiamine) and G (riboflavin).

Analysis (submitted by manufacturer).—Moisture 24.1%, total solids 75.9%, ash 1.9%, fat (ether extract) 0.4%, protein ($N \times 6.25$) 0.4%, crude fiber none, sucrose 15.6%, reducing sugar as invert sugar 48.0%, carbohydrates other than crude fiber (by difference) 71.6%, calcium (Ca) 0.023%, phosphorus (P) 0.065%, iron (Fe) 0.0013%, total acidity as malic acid 1.6%, alcohol precipitate (pectic substances) 0.4%, pH 4.0, alkalinity of ash (number of cc. of normal acid required to neutralize ash from 100 Gm. sample) 21.2. Tests of lead and arsenic show that the product complies with Council requirements for freedom from toxic spray residues.

Protocols of biologic assay (1940) indicate that the product contains not less than 250 international units of vitamin B₁ and 375 Sherman-Bourquin units of vitamin G per fluidounce.

Calories.—2.83 per gram; 80 per ounce; 3.76 per cubic centimeter; 111 per fluidounce.

State Mill and Elevator, Grand Forks, N. D.

DAKOTA MAIO BRAND WHEAT GERM, mildly heat processed to prevent rancidity.

Analysis (submitted by manufacturer).—Moisture 4.0% to 5.0%, total solids 96.0% to 95.0%, ash 4.2% to 5.2%, protein ($N \times 6.25$) 30.0% to 32.0%, fat (ether extract) 10.0% to 13.0%, crude fiber 1.5% to 2.0%, carbohydrates (other than crude fiber) by difference 50.3% to 42.8%, phosphorus 1.1%, magnesium 0.25%, calcium 0.06%, iron 0.005%.

Reports of biologic assay submitted by the manufacturer (1940) indicate that the product contains not less than 11 international units of vitamin B₁ per gram, 312 per ounce; and not less than 4 Bourquin-Sherman units of vitamin G (riboflavin) per gram; 114 per ounce.

Calories.—4.11 to 4.16 per gram; 116 to 118 per ounce.

GRAIN PRODUCTS (See Accepted Foods, 1939, p. 95).

Albers Milling Company, Milwaukee.

ALBERS CARNATION BRAND ROLLED WHEAT ENRICHED WITH VITAMIN B₁, a flaked, cooked wheat with the coarser bran portion removed, with added crystalline thiamine hydrochloride.

Analysis (submitted by manufacturer).—Moisture 11.2%, total solids 88.8%, ash 1.6%, protein ($N \times 5.83$) 9.2%, fat (ether extract) 2.0%, crude fiber 1.5%, reducing sugars as invert sugar 0.1%, sucrose 2.7%, carbohydrates other than crude fiber (by difference) 74.5%, phosphorus (P) 0.31%, iron (Fe) 0.005%, calcium (Ca) 0.037%.

Report of chemical assay (1941) by the thiochrome method, submitted by the manufacturer, indicates a thiamine content of 0.0071 mg. per gram, 0.202 per ounce.

Calories.—3.53 per gram; 100.2 per ounce.

The Concedria Milling Company, Concedria, Kan.

SUNRISE BRAND PANCAKE FLOUR, containing bleached hard wheat flour, mono calcium phosphate ($\text{CaH}_2(\text{PO}_4)_2 \cdot \text{H}_2\text{O}$), sodium bicarbonate, and sodium chloride.

Analysis (submitted by manufacturer).—Moisture 11.4%, total solids 88.6%, ash 5.8%, fat (ether extract) 1.02%, protein ($N \times 5.8$) 11.8%, crude fiber 0.35%, total carbohydrates other than crude fiber (by difference) 69.6%.

Calories.—3.33 per gram; 95 per ounce.

1. J. A. M. A. **116**:2849 (June 28) 1941.

2. Hennessy, D. J., and Cerecedo, I. R.: The Determination of Free and Phosphorated Thiamine by a Modified Thiochrome Assay, *J. Am. Chem. Soc.* **61**:179 (Jan.) 1939.

3. Snell, G. G., and Strong, F. M.: Riboflavin Assay in Biological Materials by Micro Method, *Indust. & Engin. Chem., Anal. Ed.* **11**:346 (June) 1939.

1. Supplee, G. C., and Bender, R. C.: A Standardized Method for the Determination of Vitamin B₁, *Indust. & Engin. Chem., Anal. Ed.* **10**:636, 1938.

2. Supplee, G. C.; Bender, R. C., and Jensen, O. G.: Determining Riboflavin—A Fluorometric and Biological Method, *Indust. & Engin. Chem., Anal. Ed.* **11**:495, 1939.

INFANT FOODS (*See Accepted Foods, 1939, p. 156.*)

Harold H. Clapp, Inc., Rochester, N. Y.

CLAPP'S BRAND STRAINED APRICOTS WITH APPLES.

Analysis (submitted by manufacturer).—Moisture 82.29%, total solids 17.71%, ash 0.41%, ether extract 0.10%, protein (N \times 6.25) 0.40%, crude fiber 0.55%, carbohydrates other than crude fiber (by difference) 16.25%.

Calories.—0.68 per gram; 20.3 per ounce.

MILK AND MILK PRODUCTS (*See Accepted Foods, 1939, p. 230.*)

Denla S. A. Compania Anonima, Long Island City, N. Y.

DENIA, a spray-dried whole milk powder.

Analysis (submitted by manufacturer).—Moisture 2.0%, total solids 98.0%, ash 5.6%, protein (N \times 6.38) 26.7%, fat (Mojonnier Method) 28.0%, lactose (by difference) 37.7%.

Calories.—5.10 per gram; 145 per ounce.

PREPARATIONS USED IN THE FEEDING OF INFANTS, FRUITS, VEGETABLES AND OTHER PREPARATIONS (*See Accepted Foods, 1939, p. 185.*)

Libby, McNeill & Libby, Chicago.

LIBBY'S BRAND CHOPPED CARROTS.

Analysis (submitted by manufacturer).—Moisture 92.8%, total solids 7.2%, ash 1.0%, sodium chloride 0.7%, fat (ether extract) 0.1%, protein (N \times 6.25) 0.7%, crude fiber 0.7%, carbohydrates other than crude fiber (by difference) 4.7%, calcium (Ca) 0.02%, phosphorus (P) 0.02%, iron (Fe) 0.0009%, copper (Cu) 0.00005%.

Calories.—0.22 per gram; 6.3 per ounce.

LIBBY'S BRAND CHOPPED BEETS.

Analysis (submitted by manufacturer).—Moisture 91.0%, total solids 9.0%, ash 1.2%, sodium chloride 0.8%, fat (ether extract) 0.01%, protein (N \times 6.25) 0.8%, crude fiber 0.6%, carbohydrates other than crude fiber (by difference) 6.3%, calcium (Ca) 0.015%, phosphorus (P) 0.011%, iron (Fe) 0.0007%, copper (Cu) 0.00009%.

Calories.—0.29 per gram; 8.2 per ounce.

LIBBY'S BRAND CHOPPED GREEN BEANS.

Analysis (submitted by manufacturer).—Moisture 93.4%, total solids 6.6%, ash 0.9%, sodium chloride 0.7%, fat (ether extract) 0.04%, protein (N \times 6.25) 1.2%, crude fiber 1.3%, carbohydrates other than crude fiber (by difference) 3.2%, calcium (Ca) 0.034%, phosphorus (P) 0.027%, iron (Fe) 0.0009%, copper (Cu) 0.0001%.

Calories.—0.18 per gram; 5.1 per ounce.

LIBBY'S BRAND CHOPPED SPINACH.

Analysis (submitted by manufacturer).—Moisture 94.2%, total solids 5.8%, ash 1.4%, sodium chloride 0.9%, fat (ether extract) 0.2%, protein (N \times 6.25) 1.8%, crude fiber 0.9%, carbohydrates other than crude fiber (by difference) 1.5%, calcium (Ca) 0.11%, phosphorus (P) 0.3%, iron (Fe) 0.0018%, copper (Cu) 0.00004%.

Calories.—0.15 per gram; 4.3 per ounce.

LIBBY'S BRAND MEATLESS SOUP, a chopped mixture of celery, potatoes, peas, carrots, tomato juice, soy bean flour, barley and salt.

Analysis (submitted by manufacturer).—Moisture 82.3%, total solids 17.7%, ash 1.4%, sodium chloride 0.8%, fat (ether extract) 0.3%, protein (N \times 6.25) 3.2%, crude fiber 1.3%, carbohydrates other than crude fiber (by difference) 11.5%, calcium (Ca) 0.02%, phosphorus (P) 0.07%, iron (Fe) 0.0025%, copper (Cu) 0.00014%.

Calories.—0.61 per gram; 17 per ounce.

LIBBY'S BRAND CHOPPED CHICKEN LIVER SOUP, a mixture of chopped carrots, celery, tomato juice, chicken livers, barley flour, salt and onions.

Analysis (submitted by manufacturer).—Moisture 90.5%, total solids 9.5%, ash 1.1%, sodium chloride 0.8%, fat (ether extract) 0.3%, protein (N \times 6.25) 2.0%, crude fiber 0.5%, carbohydrates other than crude fiber (by difference) 5.6%, calcium (Ca) 0.018%, phosphorus (P) 0.040%, iron (Fe) 0.0030%, copper (Cu) 0.00008%.

Calories.—0.33 per gram; 9.4 per ounce.

LIBBY'S BRAND CHOPPED APRICOTS, sweetened.

Analysis (submitted by manufacturer).—Moisture 81.4%, total solids 18.7%, ash 0.6%, sodium chloride 0.02%, fat (ether extract) 0.02%, protein (N \times 6.25) 0.7%, crude fiber 0.6%, carbohydrates other than crude fiber (by difference) 16.8%, calcium (Ca) 0.009%, phosphorus (P) 0.025%, iron (Fe) 0.0008%, copper (Cu) 0.00009%.

Calories.—0.70 per gram; 20 per ounce.

LIBBY'S BRAND CHOPPED PEACHES, sweetened.

Analysis (submitted by manufacturer).—Moisture 83.7%, total solids 16.3%, ash 0.4%, sodium chloride 0.01%, fat (ether extract) 0.01%, protein (N \times 6.25) 0.5%, crude fiber 0.6%, carbohydrates other than crude fiber (by difference) 14.8%, calcium (Ca) 0.007%, phosphorus (P) 0.018%, iron (Fe) 0.0007%, copper (Cu) 0.00005%.

Calories.—0.61 per gram; 17 per ounce.

LIBBY'S BRAND CHOPPED PEARS, sweetened.

Analysis (submitted by manufacturer).—Moisture 82.9%, total solids 17.1%, ash 0.3%, sodium chloride 0.05%, fat (ether extract) 0.02%, protein (N \times 6.25) 0.3%, crude fiber 1.2%, carbohydrates other than crude fiber (by difference) 15.3%, calcium (Ca) 0.010%, phosphorus (P) 0.014%, iron (Fe) 0.0016%, copper (Cu) 0.00013%.

Calories.—0.63 per gram; 18 per ounce.

LIBBY'S BRAND CHOPPED PRUNES WITH LEMON JUICE.

Analysis (submitted by manufacturer).—Moisture 67.5%, total solids 32.5%, ash 1.0%, sodium chloride 0.03%, fat (ether extract) 0.1%, protein (N \times 6.25) 1.0%, crude fiber 1.8%, carbohydrates other than crude fiber (by difference) 28.6%, calcium (Ca) 0.031%, phosphorus (P) 0.039%, iron (Fe) 0.0051%, copper (Cu) 0.0001%.

Calories.—1.19 per gram; 34 per ounce.

PREPARATIONS USED IN THE FEEDING OF INFANTS (*See Accepted Foods, 1939, p. 156.*)

Beech-Nut Packing Co., Canajoharie, N. Y.

BEECH-NUT BRAND CHOPPED VEGETABLES AND BEEF WITH RICE AND BARLEY, a cooked mixture of chopped carrots, potatoes, beef, celery, tomato puree, rice, barley and sodium chloride.

Analysis (submitted by manufacturer).—Moisture 85%, total solids 15%, ash 1.5%, fat (ether extract) 0.8%, protein (N \times 6.25) 3.4%, crude fiber 0.5%, carbohydrates other than crude fiber (by difference) 8.8%, calcium (Ca) 0.02%, phosphorus (P) 0.031%, iron (total Fe) 0.001%, iron (available Fe) ¹ 0.0007%, copper (Cu) ² 0.00009%, specific gravity 1.044.

Calories.—0.56 per gram; 16 per ounce.

BEECH-NUT BRAND CHOPPED APRICOTS AND APPLESauce, a cooked mixture of chopped apricots (dried without sulfur dioxide) and apples.

Analysis (submitted by manufacturer).—Moisture 83%, total solids 17%, ash 0.6%, fat (ether extract) 0.1%, protein (N \times 6.25) 0.6%, crude fiber 0.8%, sugars after inversion (as sucrose) 10.6%, carbohydrates other than crude fiber (by difference) 14.9%, calcium (Ca) 0.025%, phosphorus (P) 0.018%, iron (total Fe) 0.0008%, iron (available Fe) ¹ 0.0007%, copper (Cu) ² 0.00013%, specific gravity 1.078.

Calories.—0.63 per gram; 18 per ounce.

BEECH-NUT BRAND STRAINED APRICOTS AND APPLES, a cooked mixture of apricots (dried without sulfur dioxide) and apples.

Analysis (submitted by manufacturer).—Moisture 81.8%, total solids 18.2%, ash 0.7%, fat (ether extract) 0.1%, protein (N \times 6.25) 0.6%, crude fiber 0.6%, sugars after inversion (as sucrose) 11.4%, carbohydrates other than crude fiber (by difference) 16.1%, calcium (Ca) 0.025%, phosphorus (P) 0.019%, iron (total Fe) 0.0008%, iron (available Fe) ¹ 0.0007%, copper (Cu) ² 0.00015%, specific gravity 1.077.

Calories.—0.68 per gram; 19 per ounce.

BEECH-NUT BRAND STRAINED SQUASH.

Analysis (submitted by manufacturer).—Moisture 89.7%, total solids 10.3%, ash 0.5%, fat (ether extract) 0.3%, protein (N \times 6.25) 1.1%, crude fiber 0.1%, carbohydrates other than crude fiber (by difference) 8.3%, calcium (Ca) 0.03%, phosphorus (P) 0.012%, iron (total Fe) 0.0009%, iron (available Fe) ¹ 0.0007%, copper (Cu) 0.0002%, specific gravity 1.053.

Calories.—0.4 per gram; 11 per ounce.

BEECH-NUT BRAND CHOPPED VEGETABLES AND LAMB WITH RICE, a chopped cooked mixture of carrots, potatoes, celery, onions, milk, lamb, lamb liver, rice and sodium chloride.

Analysis (submitted by manufacturer).—Moisture 85.3%, total solids 14.7%, ash 1.7%, fat (ether extract) 1.1%, protein (N \times 6.25) 2.3%, crude fiber 0.4%, carbohydrates other than crude fiber (by difference) 9.2%, calcium (Ca) 0.036%, phosphorus (P) 0.047%, iron (total Fe) 0.00061%, iron (available Fe) 0.00059%, copper (Cu) 0.00008%.

Calories.—0.56 per gram; 16 per ounce.

SUGARS AND SYRUPS (*See Accepted Foods, 1939, p. 324.*)

A. E. Staley Manufacturing Company, Decatur, Ill.

STALEY'S SWEETOSE BRAND GOLDEN SYRUP, a mixture of sweetose and refiners' syrup.

Analysis (submitted by manufacturer).—Moisture 25.5%, total solids 74.5%, ash (residue remaining at 500 to 550 C.) 0.6%, reducing sugars as dextrose 48.0%, sucrose 4.0%, dextrins (nonfermentable) 22.3%, total carbohydrates (by difference) 73.4%.

Calories.—3.0 per gram; 85 per ounce.

VEGETABLES AND MUSHROOMS (*See Accepted Foods, 1939, p. 340.*)

General Foods Corporation, New York, product distributed by Frosted Foods Sales Corporation, New York.

BIRDS EYE BRAND QUICK-FROZEN SPINACH, quick-frozen, ready-to-cook spinach.

Analysis (submitted by manufacturer).—Average: Moisture 91.1%, total solids 8.9%, ash 1.3%, fat (ether extract) 0.5%, protein (N \times 6.25) 2.9%, invert sugar 0.2%, sucrose 0.5%, crude fiber 0.7%, carbohydrates other than crude fiber (by difference) 3.5%. Range: Moisture 89.6 to 91.6%, total solids 8.4 to 10.4%, ash 1.2 to 1.4%, fat (ether extract) 0.4 to 0.6%, protein (N \times 6.25) 2.4 to 3.3%, sucrose 0.1 to 1.2%, invert sugar 0.1 to 0.3%, crude fiber 0.7 to 0.8%, carbohydrates other than crude fiber (by difference) 2.8 to 4.5%.

The firm reports (1941) that the product contains (fresh basis) 300 international units of vitamin A per gram,¹ 3.4 international units of thiamine per gram,² 1.1 Sherman-Bourquin units of riboflavin per gram,³ and 6.6 international units of vitamin C per gram.³

Calories.—Average: 3 per gram; 85 per ounce. Range: 2.8 to 3.8 per gram; 79 to 108 per ounce.

1. According to Shackleton and McCance: The Ionizable Iron in Foods, *Biochem. J.* 30: 582 and Hill: A Method for the Estimation of Iron in Biological Materials, *Proc. Roy. Soc. London. Series B* 107: 205, 1930.

2. According to method of McFarlane, W. D.: Application of the Sodium Diethyl-Dithiocarbamate Reaction to the Micro-Colorimetric Determination of Copper in Organic Substances, *Biochem. J.* 26: 1022, 1932.

3. Vitamin A was calculated on the basis that 0.6 microgram of carotene equals 1 international unit. Fitzgerald, G. A., and Fellers, C. R.: Carotene and Ascorbic Acid Content of Fresh Market and Commercially Frozen Fruits and Vegetables, *Food Research* 8: 109, 1938.

4. Fellers, C. R.; Eselen, W. B., Jr., and Fitzgerald, G. A.: Vitamin B₂ and Vitamin B₃ (G) Content of Vegetables as Influenced by Quick Freezing and Canning, *Food Research* 5: 495, 1940.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, AUGUST 2, 1941

WAR AND THE SPREAD OF EPIDEMIC DISEASES

Again the four horsemen of the apocalypse are riding. Once more war, hunger, disease and death destroy mankind. The horsemen of today travel with the increased speed of mechanized transportation. Today the possibilities for sudden and widespread outbreaks of disease arising far from their endemic foci are more likely than ever previously.

Among the endemic diseases which are kept from epidemic proportions only by the most stringent public health activities are malaria, yellow fever, typhus and plague. News dispatches from Europe indicate already that typhus is being held in check only with the greatest difficulty. Indeed, with the fragmentary information available it has probably reached serious epidemic proportions already in certain areas, especially Poland and the Balkans.

No doubt plague, as far as this country is concerned, is a problem of greater potentiality. Epidemiologic data give definite information on the comparative permanence of endemic foci of plague infections in localities many years after epidemics of the disease have subsided. Once plague has appeared in a community, especially in cities with extensive port facilities, all known control measures for this disease must remain actively employed by the local public health agencies for prolonged periods. There can be no cessation of control measures. These demand the careful checking of the infectivity of fleas combed from rats and other rodents. This is done by the inoculation of selected and area-notated pools of fleas into guinea pigs, and the subsequent identification of the plague bacillus by suitable culture methods when evidence of the disease occurs in the guinea pigs.

Although atmospheric conditions are still an obscure factor in the spread and periodic acceleration in virulence of many diseases, in plague relative high humidity and low and equitable mean temperatures seem to play an important part. Moreover, it is possible in areas in which the infection has remained subdued or dormant

that atypical unrecognized lesions on necropsy may occur in rats; perhaps some of these rodents may be healthy carriers. Under such circumstances, inoculations of pools of fleas may become an important source of information.

Reported plague infection has been recently proved in fleas from rats in San Francisco, from ground squirrels in Kern County, California, from ground squirrels in Ada County, Idaho, and from a marmot in Malheur County, Oregon.¹

In San Francisco County the health department, with the assistance of the United States Public Health Service, has maintained a system of plague control since 1908, consisting of the enforcement of ratproof ordinances in buildings, trapping, poisoning and examinations of the carcasses of rodents by necropsy, laboratory cultures when necessary, and, finally, in 1938, inoculation of pools of fleas into guinea pigs.

In spite of the fact that the rat has always been regarded as the source of epidemics in human beings, the discovery of widespread distribution of plague in the ground squirrel and perhaps other rodents is not reassuring. To control this serious menace there must be a careful integration of the control activities of cities, counties, states and the federal government, with the use of trained personnel and the appropriation of adequate funds. If this is not done, the consequences may be indeed tragic.

Clearly the insulation of this country from the disease consequences of war will prove a colossal task and will require the most careful planning and effort.

AUROTHERAPY IN RHEUMATOID ARTHRITIS

Previous to 1936, reports on the use of gold salts in the treatment of arthritis had appeared mainly in European and British journals. In 1935 an editorial appeared in *THE JOURNAL*¹ surveying some of these reports and warning of the attendant dangers of gold therapy. Since that date communications have appeared not infrequently in domestic scientific literature. At a meeting of the American Rheumatism Association² a physician stated that 976 out of 3,229 articles on arthritis listed in the *Quarterly Cumulative Index Medicus* from 1932 through 1936 dealt solely with treatment; 80 of the 976 discussed aurotherapy. The majority of communications pointedly draw attention to toxic possibilities. The more enthusiastic investigators are convinced that clinical results offset the untoward reactions; the more conservative advise caution and further experimentation and clinical investigation before deciding on the efficacy of gold therapy in arthritis.

1. Plague Infection in California, Idaho and Oregon, *Pub. Health Rep.* 56:1295 (June) 20) 1940.

1. Gold Therapy in Arthritis, editorial, *J. A. M. A.* 105:2173 (Dec. 28) 1935.

2. Snyder, R. G.; Lust, F. J.; Traeger, C. H., and Kelly, L. C.: Gold Salt Therapy in Chronic Arthritis, *abstr. J. A. M. A.* 109:117 (Oct. 16) 1937.

Inquiries which come to THE JOURNAL and to the Council on Pharmacy and Chemistry indicate that promotional activities for the use of gold preparations are not quiescent. Gold preparations have been offered for oral, intramuscular, intravenous and topical use, the latter as a nasal instillant, gargle, paste, cream or suspension. They have been advocated for rheumatoid arthritis and osteoarthritis, septicemia, typhoid, bronchopneumonia, asthma, influenza, pulmonary tuberculosis, epidemic encephalitis, alcoholism, migraine and malnutrition. Again, they have been suggested by some pharmaceutical houses as sedatives, antispasmodics, analgesics, heart stimulants, hematinics, to treat debility and neurosis and even for acute and chronic nephritis. An example of the exaggerated and misleading claims not infrequently encountered is cited in a report³ by the Council on Pharmacy and Chemistry. This report relates to a colloidal gold preparation promoted for therapeutic use in the treatment of cancer.

The dangers of chrysotherapy make it evident that this type of therapy should be undertaken only by those who have had extensive experience and who are fully aware of the dangers. Untoward reactions have been discussed before in THE JOURNAL.⁴ Those reported include generalized erythema, dermatitis, chrysiasis, granulocytopenia, aplastic anemia, purpura hemorrhagica, alopecia, stomatitis, ulceration of the mouth, stomach and upper part of the intestine, enteritis, nausea and vomiting, bronchial irritation, fever, generalized pruritus, deafness, delirium, hepatic impairment, edema of the glottis, labial edema, hyperkeratosis of the soles, herpes zoster, lichen planus, erythema nodosum, nephritis, prostration and death. This is an imposing list of possible toxic manifestations for a form of treatment that is the object of renewed attention. Periodically, gold therapy for various pathologic processes has been revived, but, without exception, interest has decreased when reports of intoxication came to light. The Council on Pharmacy and Chemistry recognizes the use of some gold preparations only in the therapy of lupus erythematosus.

The Council recently reviewed the recent publications on chrysotherapy in rheumatoid arthritis. These reports appeared to indicate that, when careful histories were taken, reactions ranging from a mild to a severe character occurred in almost half of the treated patients. As regards the therapeutic outcome, the percentage of reported "cures" is appreciably lower in the United States than in foreign countries. Again, it has been stated⁵ that great relief has been obtained in only 10 to 35 per cent of the cases, according to American

reports, contrasting with 50 to 70 per cent reported in foreign publications.

Do the results warrant the risks? Many European workers believe that gold salts for rheumatoid arthritis are worthy of trial; but the majority of the more cautious American investigators adopt a conservative attitude about more general employment of aurotherapy. In the opinion of the Council on Pharmacy and Chemistry there do not appear to be sufficient controlled data to warrant recognition of the use of gold salts for other than selected cases of lupus erythematosus. The precise way in which gold acts is not known, and complete success with this form of therapy may be considered highly problematic. Again, a careful search for possible contraindications must always be made prior to institution of treatment. In view of the dangerous possibilities, the definite place of aurotherapy in rheumatoid arthritis remains controversial. Certainly the use of gold is always accompanied by the possibility of untoward reactions, and these reactions have terminated more than once in the death of the patient.

Current Comment

RETURN YOUR INFORMATION CARD FOR THE DIRECTORY PROMPTLY

About September 1 an information card will be sent from the headquarters office of the American Medical Association to every physician in the United States and Canada. The information secured is to be used in compiling the Seventeenth Edition of the American Medical Directory. The directory is prepared at regular intervals in the Biographic Department of the American Medical Association. The last previous edition appeared in 1940. This volume is one of the most important contributions of the American Medical Association to the work of the medical profession in the United States; it has been especially valuable in the medical preparedness program. In it, as in no other published directory, are dependable data concerning physicians, hospitals, medical organizations and activities. The directory provides full information concerning medical colleges, specialization in the field of medical practice, memberships in special medical societies, tabulations of medical journals and medical libraries and, indeed, practically every important fact concerning the medical profession in which any one might possibly be interested. Before filling out the information card, read the instructions carefully. Physicians are especially urged to state whether or not they are on extended active duty for the medical reserve corps of the United States Army and Navy. Fill out the card and return it promptly whether or not a change has occurred in any points on which information is requested. If a change of address occurs before March 1, 1942 report it at once. Should you fail to receive a card before the first of October, write at once to the headquarters office stating that fact and indicating such changes as you may desire in the information published in the 1940 issue of the directory.

3. Collodarium Not Acceptable for N. N. R., Reports of the Council on Pharmacy and Chemistry, J. A. M. A. 111: 531 (Aug. 6) 1938.

4. Anderson, N. L., and Palmer, W. L.: The Danger of Gold Salt Therapy, J. A. M. A. 115: 1627 (Nov. 9) 1940. Perry, M. W.: Gold Injections and Colitis, *ibid.* 113: 965 (Sept. 2) 1939. Margolis, H. M., and Eisenstein, V. W.: Some Specific Measures in the Treatment of Rheumatoid Arthritis, *ibid.* 114: 1429 (April 13) 1940. Gold Therapy in Arthritis, J. A. M. A. 114: 1429 (April 13) 1940.

5. Gold Sodium Thiosulfate in Arthritis, Queries and Minor Notes, J. A. M. A. 114: 2049 (May 18) 1940.

NASAL OBSTRUCTION AND IMPAIRMENT OF HEARING

Literature contains many theories as to the causation of chronic types of impairment of hearing. Many otologists believe that nasal obstruction causes or contributes to certain types of deficiency of hearing and advocate submucous resection of the nasal septum as treatment for chronic nonsuppurative otitis media. Apparently the only way in which nasal obstruction could interfere with hearing is by causing some involvement of the eustachian tube, with subsequent impairment of the ventilation of the middle ear. The Report of the Committee on the Problems of the Hard of Hearing from the Section on Laryngology, Otology and Rhinology of the American Medical Association¹ states that "the most important etiologic factors according to the majority of otologists are nose and throat conditions that directly affect the eustachian tube." In children the most potent cause of tubal inflammation is adenoids. About 85 per cent of all deafness is due to middle ear involvement, and 90 per cent of these middle ear involvements have their origin in inflammatory conditions of the nasopharynx with extension to the ear by way of the eustachian tube. In a recent article Johnson² deprecates the tendency to associate middle ear disease etiologically with anatomic variations in the nasal chambers, a theory based on the supposition that these variations cause middle ear disease by mechanically altering the air current in the nasopharynx. Shambaugh's³ 2 cases of congenital atresia of the choanae with complete blockage of the air passage to the nasopharynx and without middle ear disease disprove this contention. A common cause of disturbance of sound conduction is to be seen in the occlusion of the pharyngeal end of the eustachian tube by adenoids, tumor, hyperplasia of the posterior end of the turbinates, and common inflammations such as colds. Johnson believes that local noninflammatory disease of the nose, such as deformity of the septum, cannot lead to occlusion of the tubes and therefore cannot be a cause of difficulty with hearing. Shambaugh⁴ points out that the various operations on the nose for the relief of ear trouble are based on the erroneous confusion of the tubotympanic processes, so common in childhood, with the chronic persisting processes which occur in adult life. Crowe and Baylor⁵ found an abnormal growth of lymphoid tissue partially obstructing the nasopharyngeal orifice of the eustachian tube in children with impaired hearing for high tones. They treated this lymphoid hyperplasia by means of a radium bomb and obtained excellent results. They state that if the condition is treated before the age of 15 the hearing usually returns to near the normal level; after this age the lesions in the middle ear may have progressed to the point of being irreversible. Johnson performed

submucous resection for nasal obstruction in 46 cases. In 35 (65 per cent) of these there was either no deficiency in hearing or only high tonal dips. In the cases in which some impairment of hearing was present, the improvement demonstrated with the audiometer was too insignificant to warrant urging the operation as a means of improving hearing. Johnson concludes that nasal obstruction does not cause a characteristic impairment of hearing and that therefore submucous resection is not to be recommended as a means of improving deficiency in hearing.

DARK ADAPTATION AND VITAMIN A

The use of dark adaptation tests as means of determining vitamin A deficiency has received much study. Recently Jeans and his colleagues¹ have presented further evidence that the biophotometer, which is one of the instruments used for this purpose, gives consistent testing results with regard to the vitamin A status of human beings. Normal subjects with normal vitamin A intake, while remaining in good health, have normal test results with this instrument at all times. The subjects studied by Jeans and his co-workers who had poor dark adaptation and who submitted to therapy obtained normal adaptation in all instances while receiving vitamin A. In the geographic region in which the tests were made, dietary deficiencies alone seemed to be the cause of impaired dark adaptation in but few instances. The most frequent and usual cause of impaired adaptation seemed to be a utilization deficiency resulting from illness, especially when due to infection. In an orphanage in which children were receiving approximately 2,000 units of vitamin A in the daily diet, instances of abnormal dark adaptation by the biophotometer test were not observed during a winter period of observation. In another group of one hundred and twenty school children, however, 5 per cent had dark adaptation not wholly normal in the fall and almost 20 per cent demonstrated abnormal adaptation in the winter. This variation in seasonal incidence, these investigators believe, is related more closely to the seasonal occurrence of infection than to seasonal variations in diet. In a study comparing the biophotometer and the Hecht-Schlaer adaptometer as comparable instruments for measuring dark adaptation, Eckardt and Johnson² found that the rod adaptation as measured with the biophotometer and the Hecht-Schlaer adaptometer is identical, although some difficulty may be encountered in measuring the cone adaptation with the biophotometer. They feel, however, that the continued use of the biophotometer in the study of vitamin A deficiency is valid and gives a true picture of dark adaptation. Although the problems of measuring vitamin A deficiency by means of dark adaptation tests are complex and somewhat controversial, the evidence at hand indicates that some of these tests, at least when carefully controlled, give sufficiently consistent results, at least by competent observers, to warrant their acceptance as accurate measures.

1. Hays, Harold; Newhart, Horace; Pierce, Norval; Phillips, Wendell, and Shambaugh, George: Report of the Committee on the Problems of the Hard of Hearing, Section on Laryngology, Otology and Rhinology, J. A. M. A. 83:2094 (Dec. 27) 1924.

2. Johnson, M. R.: Nasal Obstruction and Impairment of Hearing: Report of Forty-Six Cases of Submucous Resection with Audiometric Studies, Arch. Otolaryng. 33:536 (April) 1941.

3. Shambaugh, G. E.: The Relation of Nose and Throat to Ear Diseases, Illinois M. J. 42:431 (Dec.) 1922.

4. Shambaugh, G. E.: Facts and Fancies in the Practice of Otolaryngology, J. A. M. A. 87:1720 (Nov. 20) 1926.

5. Crowe, S. J., and Baylor, J. W.: The Prevention of Deafness, J. A. M. A. 112:585 (Feb. 18) 1939.

1. Jeans, P. C.; Blanchard, Evelyn L., and Satterthwaite, F. E.: Dark Adaptation and Vitamin A: Further Studies with the Biophotometer, J. Pediat. 18:179 (Feb.) 1941.

2. Eckardt, R. E., and Johnson, L. V.: A Comparison of the Methods of Measuring Dark Adaptations, J. Pediat. 18:195 (Feb.) 1941.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

NATIONAL GUARD MEDICAL OFFICERS ON ACTIVE DUTY

Following is a list of the medical officers on duty with National Guard units of the various states which have been called into active service, together with the organization and camp at which they were serving when this report was recently submitted to these headquarters. Those from the other states were published last week.

NEW YORK

ADAMS, Vincent J., 1st Lieut., Brooklyn, 186th Field Artillery, Madison Barracks, Sackets Harbor, N. Y.
AINSWORTH, Thomas H., Captain, Beacon, 156th Field Artillery.
BACCHIANI, Torquato L., 1st Lieut., Nesconset, 101st Signal Battalion, Camp Shelby, Miss.
BALL, Thomas L., 1st Lieut., New York City, 187th Field Artillery, Fort Ethan Allen, Vt.
BOYD, James R., Major, Brooklyn, 245th Coast Artillery (HD), Fort Hancock, N. J.
CALHOUN, Douglas A., Captain, Ray Brook, 105th Infantry.
CARRANO, Armand T., 1st Lieut., Brooklyn, 187th Field Artillery, Fort Ethan Allen, Vt.
CARTER, Robert E., Major, Jamaica, 369th Coast Artillery (AA), Fort Ontario, Oswego, N. Y.
CERAVOLO, Raphael J., 1st Lieut., Brooklyn, 186th Field Artillery, Madison Barracks, Sackets Harbor, N. Y.
CLARK, George B., Major, Armonk, 108th Inf., Fort McClellan, Ala.
COLE, Robert F., 1st Lieut., Brooklyn, 102d Med. Regt., Fort McClellan.
CONSTANTINO, Joseph G., 1st Lieut., Flushing, 101st Cavalry.
CRATER, Robert L., Captain, New York City, 369th Coast Artillery (AA), Fort Ontario, Oswego, N. Y.
DAVIS, Ralph H., Major, Penn Yan, 134th Med. Regt., Fort Bragg.
DINERMAN, Benjamin V., Captain, Brooklyn, 101st MP Battalion.
DUNGAN, Clarence E., 1st Lieut., Auburn, 134th Med. Regt., Ft. Bragg.
EPSTEIN, William M., 1st Lieut., Newark, N. J., 134th Medical Regiment, Fort Bragg, N. C.
EVANS, John A., Captain, New York City, 207th Coast Artillery (AA), Camp Stewart, Ga.
FITZGERALD, Thomas G., 1st Lieut., Albany, 134th Medical Regiment, Fort Bragg, N. C.
FUGE, Wilfred W., Captain, Buffalo, 174th Infantry, Fort Dix, N. J.
GAUS, Louis H., Colonel, Ticonderoga, State Staff.
GOLDSTEIN, Philip, Captain, Brooklyn, 105th Field Artillery, Fort McClellan, Ala.
GORSCH, Rudolph V., Major, New York City, 207th Coast Artillery (AA), Camp Stewart, Ga.
GRIFFIN, Donald C., Major, New York City, 71st Infantry.
HAMILL, John A. C., Captain, Port Chester, 102d Medical Regiment, Fort McClellan, Ala.
HANLON, Lawrence W., Capt., Port Chester, 209th Coast Artil., (AA).
HAYMAN, Charles R., Captain, White Plains, 258th Field Artillery, Fort Ethan Allen, Vt.
HEBEL, Herbert D., 1st Lieut., Auburn, 134th Med. Regt., Fort Bragg.
HOEY, Patrick H., 1st Lieut., Scarsdale, 102d Medical Regiment, Fort McClellan, Ala.
HOOD, Robert I., Captain, Corning, 134th Med. Regt., Fort Bragg, S. C.
HUBER, Henry S., Captain, New York City, 207th Coast Artillery (AA), Camp Stewart, Ga.
JACKSON, William O., Major, Brooklyn, 102d Medical Regiment, Fort McClellan, Ala.
JOHNSON, Harry G., Major, Buffalo, 174th Infantry, Fort Dix, N. J.
JOHNSON, Paul C., 1st Lieut., Penn Yan, 134th Med. Regt., Fort Bragg.
JOHNSON, Ted, Capt., N. Y. City, 102d Med. Regt., Fort McClellan.
JONES, Ceirionog H., 1st Lieut., Scranton, Pa., 244th Coast Artillery, Camp Pendleton, Va.
KALLET, Joseph R., 1st Lieut., Syracuse, 108th Inf., Fort McClellan.
KELLEHER, Vincent R., 1st Lieut., Port Edward, 134th Medical Regiment, Fort Bragg, N. C.
LANE, Theron L., Captain, Ossining, 244th Coast Artillery, Camp Pendleton, Va.
LASKY, Mortimer A., Major, Brooklyn, 186th Field Artillery, Madison Barracks, Sackets Harbor, N. Y.
LEFKOWITZ, Michael P., 1st Lieut., New York City, 105th Field Artillery, Fort McClellan, Ala.
LUBITZ, Benjamin, Major, Brooklyn, 102d Regiment, Fort McClellan.
MacDONALD, John K., Major, White Plains, 102d Medical Regiment, Fort McClellan, Ala.
MANDRACCHIA, John L., Major, New York City, 212th Coast Artillery (AA).

MARCOU, Milton, 1st Lieut., Brooklyn, 105th Field Artillery, Fort McClellan, Ala.
McCASTOR, Joseph T. N., Captain, New York City, 102d Engineers, Fort McClellan, Ala.
McDONOUGH, Thomas C., 1st Lieut., Buffalo, 102d Separate Battalion Coast Artillery (AA).
McKENNA, Walter D., Major, Troy, 105th Infantry.
McKEON, John G., 1st Lieut., Albany, 134th Med. Regt., Fort Bragg.
McLAUGHLIN, John J., 1st Lieut., Albany, 101st Anti-Tank Battalion, Fort Benning, Ga.
MIERAS, Marion D., 1st Lieut., Elmira, 134th Med. Regt., Fort Bragg.
MOORE, Francis W., Colonel, Brooklyn, 134th Med. Regt., Fort Bragg.
MURPHY, James M., 1st Lieut., Willard, 134th Med. Regt., Fort Bragg.
MURRAY, William J., 1st Lieut., Binghamton, 106th Infantry, Fort McClellan, Ala.
NILES, Charles E., Major, Poughkeepsie, 155th Field Artillery.
NORMAN, Abraham, Captain, New York City, Special Troops, 27th Division, Fort McClellan, Ala.
NORTHBRIDGE, John A., Captain, Brooklyn, 102d Medical Regiment, Fort McClellan, Ala.
O'BRIEN, Richard A., Major, Corning, 134th Med. Regt., Fort Bragg.
OEHLER, Harry R., 1st Lieut., Buffalo, 174th Infantry, Fort Dix, N. J.
OLSHANSKY, Abraham L., Major, Albany, 106th Inf., Fort McClellan.
PAGANELLI, Americus J., Captain, New York City, 245th Coast Artillery, Fort Hancock, N. J.
PAGANELLI, Joseph E., Major, New York City, 244th Coast Artillery, Camp Pendleton, Va.
PIERCE, Lee R., Lieut. Colonel, New York City, 102d Medical Regiment, Fort McClellan, Ala.
POMERANZE, Julius, 1st Lieut., New York City, 102d Quartermaster Regiment, Fort McClellan, Ala.
POST, Arthur, Capt., N. Y. City, 258th Fld. Artillery, Ft. Ethan Allen.
PRISCO, Frank J., 1st Lieut., New York City, 102d Medical Regiment, Fort McClellan, Ala.
ROGERS, William K., Major, Flushing, 101st Cavalry.
ROONEY, James F., Lieut. Colonel, Albany, 134th Medical Regiment, Fort Bragg, N. C.
RUSSELL, Nelson Gorham, Jr., 1st Lieut., Buffalo, 174th Inf., Fort Dix.
SAFIAN, Harold, 1st Lieut., New York City, 102d Medical Regiment, Fort McClellan, Ala.
SARGENT, Carlton W., 1st Lieut., Dundee, 134th Med. Regt., Ft. Bragg.
SAUNDERS, William, 1st Lieut., Troy, 106th Inf., Fort McClellan, Ala.
SCHIMENTI, Matthew L., 1st Lieut., Yonkers, 165th Infantry, Fort McClellan, Ala.
SCHINTZIUS, William C., Capt., Boonville, 106th Inf., Fort McClellan.
SCHUTKEKER, Bruno G., Captain, Buffalo, 174th Inf., Fort Dix, N. J.
SIMON, Kona, 1st Lieut., New York City, 101st MP Battalion.
SMITH, DeWitt H., 1st Lieut., New York City, 102d Medical Regiment, Fort McClellan, Ala.
SNOW, Herman B., Captain, Binghamton, 106th Inf., Fort McClellan.
SNYDER, Charles T., Major, New York City, 167th Field Artillery, Fort Ethan Allen, Vt.
SOMMER, Abram E., Major, Brooklyn, 102d Quartermaster Regiment, Fort McClellan, Ala.
STAGNITO, Rosario J., 1st Lieut., Rochester, 209th Coast Artil. (AA).
STOCKHAMMER, Raymond J., Captain, New York City, 165th Infantry, Fort McClellan, Ala.
STOCKHAMMER, Stanley F., Captain, Forest Hills, 165th Infantry, Fort McClellan, Ala.
TAYLOR, William G., Captain, Buffalo, 209th Coast Artillery (AA).
TERRY, Richard N., 1st Lieut., Buffalo, 174th Infantry, Fort Dix, N. J.
THOMSON, John D., Captain, Syracuse, 108th Inf., Fort McClellan.
TURIGA, John R., Captain, Beacon, 102d Med. Regt., Fort McClellan.
UNDERWOOD, Edward B., Major, Brooklyn, 102d Medical Regiment, Fort McClellan, Ala.
VELARDI, Martin J., Captain, Brooklyn, 187th Field Artillery, Fort Ethan Allen, Vt.
WARD, Harrison F., Major, Rochester, 102d Med. Regt., Fort McClellan.
WARREN, Arthur F., Capt., N. Y. City, 102d Obsn. Sq., Fort McClellan.
WEED, Jefferson, Captain, Garden City, 102d Anti-Tank Battalion.
WELKER, George, Jr., 1st Lieut., Garden City, 212th Coast Artil. (AA).
WELING, Joseph G., Captain, Long Beach, 102d Medical Regiment, Fort McClellan, Ala.
WENDELKEN, Herbert F., 1st Lieut., Brooklyn, 245th Coast Artillery, Fort Hancock, N. J.
ZITTEL, Harold E., Major, Buffalo, 106th Field Artillery.

NORTH CAROLINA

BREWTON, William A., Captain, Enka, 105th Engineers, Fort Jackson.
CARTER, Paul C., Major, Madison, 105th Med. Regt., Fort Jackson.

COX, Alexander M., Capt., Madison, 105th Med. Regt., Fort Jackson.
 CRAVEN, Thomas, Major, Huntersville, 105th Engineers, Fort Jackson.
 FENNER, Edwin F., Lieut. Colonel, Pendergon, 105th Medical Regiment, Fort Jackson, S. C.
 FLEMING, Frank R., Capt., Statesville, 105th Med. Regt., Fort Jackson.
 FOX, Norman A., Captain, Greensboro, 252d Coast Artillery, Fort Moultrie, S. C.
 GLASCOCK, Harold W., Major, Raleigh, 105th Medical Regiment, Fort Jackson, S. C.
 GOLEY, Willard C., Major, Graham, 120th Infantry.
 MATHESON, Robert A., Major, Raeford, 252d Coast Artillery, Fort Moultrie, S. C.
 MOORE, Henry B., Captain, Graham, 120th Infantry.
 NEAL, Joseph W., Jr., 1st Lieut., Walnut Cove, 105th Medical Regiment, Fort Jackson, S. C.
 PATTERSON, Fred G., Captain, Chapel Hill, 113th Field Artillery, Fort Jackson, S. C.
 POWELL, Eppie C., Jr., Captain, Columbia, S. C., 113th Field Artillery, Fort Jackson, S. C.
 REYNOLDS, Ernest H., Captain, Columbia, S. C., 105th Medical Regiment, Fort Jackson, S. C.
 RODMAN, Robert B., Major, Wilmington, 105th Medical Regiment, Fort Jackson, S. C.
 SULLIVAN, Victor T., Captain, Wilmington, 252d Coast Artillery, Fort Moultrie, S. C.
 TAYLOR, Thomas J., Captain, Roanoke Rapids, 105th Medical Regiment, Fort Jackson, S. C.
 WILKINSON, Charles T., Major, Wake Forest, 113th Field Artillery, Fort Jackson, S. C.
 WISELY, Martin R., Capt., Edenton, 105th Med. Regt., Fort Jackson.
 YOUNG, Wiley R., 1st Lieut., Angier, 120th Infantry.

NORTH DAKOTA

FLANNERY, Hubert F., 1st Lieut., Bottineau, 164th Infantry, Camp Claiborne, La.
 FRANKLIN, Earl A., Capt., Gilby, 164th Infantry, Camp Claiborne, La.
 GRIFFIN, Vernon M., Captain, Grand Forks, 188th Field Artillery, Fort Francis E. Warren, Wyo.
 HAYNES, George H., Major, Lisbon, 188th Field Artillery, Fort Warren.
 NUSSLE, Robert F., Captain, Bismarck, 188th Field Artillery, Fort Francis E. Warren, Wyo.
 ROBERTSON, Frank O., Captain, East Grand Forks, Minn., 188th Field Artillery, Fort Francis E. Warren, Wyo.
 SCHATZ, George, Captain, West Fargo, 164th Inf., Camp Claiborne, La.

OHIO

AKERS, Robert H., 1st Lieut., Stoutsville, 112th Medical Regiment, Camp Shelby, Miss.
 BEACH, Wilber E., Major, Middle Point, 112th Medical Regiment, Camp Shelby, Miss.
 BERLIN, Frederick P., Captain, Wapakoneta, 136th Field Artillery, Camp Shelby, Miss.
 BILL, Herbert E., Capt., Cleveland, 107th Cavalry, Camp Forrest, Tenn.
 BLINN, John C., Jr., Captain, New Philadelphia, 112th Medical Regiment, Camp Shelby, Miss.
 BRETTELL, Howard W., Captain, Steubenville, 151st Medical Battalion, Fort McClellan, Ala.
 BRIOLA, Patsie F., Captain, Cleveland, 145th Inf., Camp Shelby, Miss.
 BURROUGHS, Shepard A., Capt., Ashtabula, 107th Cav., Camp Forrest.
 CALDWELL, Harry E., Major, Delaware, 166th Inf., Camp Shelby, Miss.
 CATON, Russell J., Major, Bucyrus, 135th Field Artillery, Camp Shelby.
 CHRISTIANSEN, James N., Major, Cincinnati, 147th Inf., Camp Shelby.
 COOPER, Wellington W., Major, Columbus, 372d Infantry.
 CRAWFORD, Henry A., Capt., Cleveland, 112th Observation Squadron.
 CRIST, Jerry O., Major, Centerburg, 112th Med. Regt., Camp Shelby.
 CURTISS, Edgar J., Major, Lima, 112th Med. Regt., Camp Shelby, Miss.
 DIX, Carr E., Capt., Columbus, 112th Med. Regt., Camp Shelby, Miss.
 DORR, Hugh C., 1st Lieut., Columbus, 112th Med. Regt., Camp Shelby.
 ENSIGN, Paul R., Lieut. Colonel, Toledo, 112th Medical Regiment, Camp Shelby, Miss.
 FRIDLINE, Gaylord D., Capt., Ashland, 112th Med. Regt., Camp Shelby.
 FRIEDMAN, Norman, 1st Lieut., Longacre, W. Va., 145th Infantry, Camp Shelby, Miss.
 GALEN, John J., Capt., Columbus, 134th Field Artillery, Camp Shelby.
 GROOM, Horace E., Lieut. Colonel, Akron, 151st Medical Battalion, Fort McClellan, Ala.
 GROTHJAN, Cletus A., Major, Toledo, 148th Infantry.
 HOISTON, Guilford B., Captain, Columbus, 372d Infantry.
 HOWE, Charles E., Capt., Westerville, 151st Med. Bat., Fort McClellan.
 HUMPHREY, Harold I., Captain, Cincinnati, 147th Inf., Camp Shelby.
 INMAN, James G., Captain, Manchester, 147th Inf., Camp Shelby, Miss.
 JACKSON, Harry D., Colonel, Circleville, 112th Medical Regiment, Camp Shelby, Miss.
 JOHNSTON, Albert M., Captain, Marysville, 166th Inf., Camp Shelby.
 KAYLOR, Frederick W., 1st Lieut., Bellefontaine, 113th Medical Regt.
 KOLB, Thomas V., Captain, South Charleston, 112th Medical Regiment, Camp Shelby, Miss.
 LECHNER, Robert H., Captain, Berea, 151st Med. Bat., Fort McClellan.
 MAY, James R., Captain, Cleveland, 145th Infantry, Camp Shelby, Miss.
 MCNERNEY, Neville H., Major, Cleveland, 145th Inf., Camp Shelby.
 MICHAEL, Nicholas, Capt., Columbus, 112th Med. Regt., Camp Shelby.
 MIKESELL, Hobart L., Major, West Liberty, 112th Medical Regiment, Camp Shelby, Miss.
 MORSE, George D., Captain, Columbus, 166th Inf., Camp Shelby, Miss.
 PITKIN, York N., Major, Cleveland, 151st Med. Bat., Fort McClellan.
 REEVES, James R., Capt., Columbus, 134th Fld. Artillery, Camp Shelby.
 RIDGEWAY, Joseph A., Captain, Columbus, Special Troops, 37th Division, Camp Shelby, Miss.
 RUPPERSBERG, Anthony, Jr., Major, Bexley, 136th Field Artillery, Camp Shelby, Miss.

SACKS, Leon J., 1st Lieut., Akron, 151st Med. Bat., Fort McClellan.
 SCOTT, Robert P., Jr., 1st Lieut., Hattiesburg, Miss., 145th Infantry, Camp Shelby, Miss.
 SMILEY, Bernard, Captain, Scranton, Pa., 151st Medical Battalion, Fort McClellan, Ala.
 SMILEY, John T., Captain, Akron, 151st Med. Bat., Fort McClellan, Ala.
 SMITH, Kenneth D., Captain, Columbus, 166th Infantry, Camp Shelby.
 SPANGLER, Frederick E., Captain, Somerset, 151st Medical Battalion, Fort McClellan, Ala.
 STOUGHTON, Wilbur A., Captain, Columbus, 134th Field Artillery, Camp Shelby, Miss.
 TAYLOR, Russell E., Capt., Sandusky, 151st Med. Bat., Fort McClellan.
 TROUP, Paul, Captain, Dayton, 136th Fld. Artillery, Camp Shelby, Miss.
 VOORHIS, Charles C., 1st Lieut., Cleveland, 107th Cavalry, Camp Forrest, Tenn.
 WALKER, Winston F., Major, Rocky River, 112th Engineers.
 WILSON, Sloan J., Major, Columbus, 112th Quartermaster Regiment.
 YAW, Owen F., Captain, Cincinnati, 147th Infantry, Camp Shelby, Miss.
 ZELLER, Robert F., 1st Lieut., Mansfield, 112th Medical Regiment, Camp Selby, Miss.

OKLAHOMA

ANDERSON, Parkey H., Major, Anadarko, 158th Field Artillery, Camp Barkeley, Texas.
 BAKER, Alfred T., Captain, Durant, 180th Infantry, Fort Sill, Okla.
 BAKER, Roscoe C., Major, Enid, 189th Field Artillery, Camp Barkeley.
 BOLDEN, Rex G., Colonel, Oklahoma City, 120th Medical Regiment, Camp Barkeley, Texas.
 BOND, Ira T., Jr., Captain, Enid, Special Troops, 45th Division.
 CLOUDMAN, Harry H., Lieut. Colonel, Oklahoma City, 120th Medical Regiment, Camp Barkeley, Texas.
 DALY, John F., Captain, Pawhuska, 120th Med. Regt., Camp Barkeley.
 DAVIDSON, Wallace N., Major, Cushing, 120th Medical Regiment, Camp Barkeley, Texas.
 DAVIS, Thomas H., Captain, Tulsa, 120th Med. Regt., Camp Barkeley.
 DEATON, Andy N., Major, Wewoka, 160th Field Artillery.
 DUNNINGTON, William G., Captain, Cherokee, 189th Field Artillery, Camp Barkeley, Texas.
 ENSEY, James E., Major, Altus, 120th Quartermaster Regt., Fort Sill.
 FOWLER, Arthur, Jr., Captain, Sulphur, 158th Field Artillery, Camp Barkeley, Texas.
 HAMMOND, James H., Capt., Tulsa, 120th Med. Regt., Camp Barkeley.
 HEMPHILL, Paul H., Captain, Pawhuska, 120th Medical Regiment, Camp Barkeley, Texas.
 HOLCOMBE, Roland N., Major, Muskogee, 180th Inf., Fort Sill, Okla.
 HOOD, James O., Captain, Norman, 179th Infantry, Fort Sill, Okla.
 KAISER, George L., Captain, Muskogee, 180th Infantry, Fort Sill, Okla.
 LAWSON, Patrick H., Major, Marietta, 179th Infantry, Fort Sill, Okla.
 LEHEW, Elton W., Captain, Pawnee, 179th Infantry, Fort Sill, Okla.
 LINDSTROM, William C., Captain, Oklahoma City, 120th Engineers, Camp Barkeley, Texas.
 McDONALD, Glen W., Captain, Ada, 120th Med. Regt., Camp Barkeley.
 McKINNEY, Millam F., Captain, Oklahoma City, 120th Quartermaster Regiment, Fort Sill, Okla.
 MILES, Walter H., Major, Oklahoma City, 120th Medical Regiment, Camp Barkeley, Texas.
 OGLESBEE, Carson L., Captain, Muskogee, 180th Infantry, Fort Sill.
 OHL, Charles W., 1st Lieut., Chickasha, 189th Field Artillery, Camp Barkeley, Texas.
 PERRY, Daniel L., Major, Cushing, 120th Med. Regt., Camp Barkeley.
 RITZHAUPT, Louis H., Major, Guthrie, State Staff.
 SANGER, Fenton A., Major, Oklahoma City, 120th Medical Regiment, Camp Barkeley, Texas.
 SMITH, Lester P., Captain, Marlow, 179th Infantry, Fort Sill, Okla.
 STARKEY, Wayne A., Captain, Altus, 120th Quartermaster Regiment, Fort Sill, Okla.
 TACKETT, Orville H., Captain, Oklahoma City, 120th Medical Regiment, Camp Barkeley, Texas.
 TAYLOR, Lewis C., Captain, Oklahoma City, 120th Medical Regiment, Camp Barkeley, Texas.
 TRACY, Gilbert W., Captain, Erick, 120th Med. Regt., Camp Barkeley.
 WALTRIP, Jesse R., Captain, Yale, 158th Fld. Artillery, Camp Barkeley.
 WEBSTER, William H., 1st Lieut., Ada, 120th Medical Regiment, Camp Barkeley, Texas.
 WOLFE, Ira C., Captain, Muskogee, 180th Infantry, Fort Sill, Okla.

OREGON

ABBOTT, George E., 1st Lieut., Portland, 218th Field Artillery, Fort Lewis, Wash.
 BAIN, Lyle M., Captain, Albany, 116th Medical Regiment, Fort Lewis.
 CHAPMAN, William H., Captain, Eugene, 186th Infantry, Fort Lewis.
 DAVIS, Thomas A., Major, Portland, 218th Field Artillery, Fort Lewis.
 GREGSON, William E., Captain, Portland, 162d Infantry, Fort Lewis.
 MILLER, Vern W., Captain, Salem, 116th Medical Regiment, Fort Lewis.
 PARKS, Earl W., Captain, Portland, 162d Infantry, Fort Lewis, Wash.
 RANKIN, John S., Captain, Portland, 218th Field Artillery, Fort Lewis.
 ROGERS, Richard S., Captain, Junction City, 186th Inf., Fort Lewis.
 ROSS, Webster K., Captain, LaGrande, 186th Inf., Fort Lewis, Wash.
 SLEETER, Robert W., 1st Lieut., Medford, 186th Inf., Fort Lewis.
 STANARD, Delbert C., Major, Eugene, 186th Infantry, Fort Lewis.
 TUPKER, Eugene P., Captain, Salem, 116th Med. Regt., Fort Lewis.
 WHITE, John BeVier, Major, Portland, 162d Infantry, Fort Lewis.
 WOOD, Robert L., Major, Salem, 249th Coast Artillery.

PENNSYLVANIA

ALLEN, Robert E., Major, Mount Carmel, 190th Field Artillery, Camp Shelby, Miss.
 APPEL, James Z., Capt., Lancaster, 103d Med. Regt., Indiantown Gap.
 BAXTER, John G., Captain, Phoenixville, 197th Field Artillery, Indiantown Gap, Pa.

BLAND, George W., Major, Philadelphia, 111th Infantry.
BOGER, John D., Lieut. Colonel, Lebanon, 103d Medical Regiment, Indiantown Gap, Pa.
BOYSON, William A., Major, Mechanicsburg, 103d Quartermaster Regt.
BROWN, Harry, 1st Lieut., Glenmoore, 111th Infantry.
CLELAND, Charles E., Major, Kane, 112th Infantry, Indiantown Gap.
COCHRAN, Harry A. Jr., Captain, Pittsburgh, 176th Field Artillery, Fort George G. Meade, Md.
COLLEY, Arthur T., Captain, Retreat, 109th Field Artillery.
COPPES, Charles D., 1st Lieut., Philadelphia, 104th Cavalry.
DAUGHERTY, Charles B., Lieut. Colonel, Tyrone, 103d Medical Regiment, Indiantown Gap, Pa.
DEATERLY, Charles F., 1st Lieut., Quakertown, 166th Field Artillery, Camp Shelby, Miss.
DIEHL, Kenneth L., 1st Lieut., Pittsburgh, 110th Inf., Indiantown Gap.
DOANE, John H., Lieut. Colonel, Mansfield, 103d Medical Regiment, Indiantown Gap, Pa.
DONALDSON, Arthur V., Captain, Canonsburg, 103d Medical Regiment, Indiantown Gap, Pa.
DOUDS, Harry E., Captain, Beaver Falls, 103d Medical Regiment, Indiantown Gap, Pa.
DOYLE, Albert F., Captain, Johnstown, 103d Quartermaster Regiment.
DUTTENHOFER, Charles S., Lieut. Colonel, Churchtown, 103d Medical Regiment, Indiantown Gap, Pa.
EVERHART, Edgar S., Lieut. Colonel, Lemoyne, 122d Medical Squadron.
FARIES, George B., Capt., Lewisburg, 190th Fld. Artillery, Camp Shelby.
FARQUHAR, George A., Major, Monongahela, 110th Infantry, Indiantown Gap, Pa.
FEIGHTNER, Francis W., 1st Lieut., Greensburg, 110th Infantry, Indiantown Gap, Pa.
FUNKE, Alvin H., Captain, Ashley, 103d Med. Regt., Indiantown Gap.
GIBSON, William Blake, 1st Lieut., Lansdowne, 108th Field Artillery, Indiantown Gap, Pa.
HANNA, Edward A., 1st Lieut., Philadelphia, 122d Medical Squadron.
HAUCK, Samuel M., Capt., Lancaster, 103d Med. Regt., Indiantown Gap.
HAZLETT, Esten L., Captain, Canonsburg, 103d Medical Regiment, Indiantown Gap, Pa.
HENDRICKS, Charles S., Lieut. Colonel, Altoona, 103d Medical Regiment, Indiantown Gap, Pa.
HODGSON, Eugene W., 1st Lieut., Houston, 103d Medical Regiment, Indiantown Gap, Pa.
HOFFSTEIN, Louis D., 1st Lieut., Philadelphia, 111th Infantry.
HOGG, Harold K., Major, Lancaster, 103d Med. Regt., Indiantown Gap.
HOOVER, Carl H., Capt., Lancaster, 103d Med. Regt., Indiantown Gap.
HOWLAND, Harry W., Captain, Galeton, 103d Medical Regiment, Indiantown Gap, Pa.
INGOLDSBY, Eugene C., Captain, Altoona, 190th Field Artillery, Camp Shelby, Miss.
KEENEY, Paul A., Major, Harrisburg, 104th Cavalry.
KOCHENDERFER, Thomas T., 1st Lieut., Norristown, 108th Field Artillery, Indiantown Gap, Pa.
LA BELLE, Charles F., Captain, Dunmore, 109th Infantry.
LAIRD, Archibald, Captain, Wellsboro, 103d Med. Regt., Indiantown Gap.
LANE, Louis A., 1st Lieut., Canonsburg, 103d Medical Regiment, Indiantown Gap, Pa.
LARKIN, Francis L., Captain, Uniontown, 110th Inf., Indiantown Gap.
LONG, Michael R., Captain, Lawrenceville, 103d Medical Regiment, Indiantown Gap, Pa.
LYNCH, James J., 1st Lieut., Philadelphia, 108th Field Artillery, Indiantown Gap, Pa.
MC BURNIE, Harold H., Captain, Washington, 103d Medical Regiment.
MC LAREN, Harold J., Major, New Brighton, 110th Infantry, Indiantown Gap, Pa.
MEISER, Edgar W., Captain, Lancaster, 103d Medical Regiment, Indiantown Gap, Pa.
NARDONE, Anthony A., Captain, Philadelphia, Special Troops, 28th Div.
PARKER, William S., Major, Bryn Mawr, 166th Field Artillery, Camp Shelby, Miss.
PASTOR, Louis M., Lieut. Colonel, Philadelphia, 103d Engineers, Indiantown Gap, Pa.
PAVLATOS, August C., Captain, Lancaster, 103d Medical Regiment, Indiantown Gap, Pa.
POHL, William F., Captain, Butler, 112th Infantry, Indiantown Gap, Pa.
POPKY, Herman B., 1st Lieut., Wilkes-Barre, 103d Medical Regiment, Indiantown Gap, Pa.
ROSENBERG, Milton M., Major, Scranton, 109th Infantry.
RUSBRIDGE, Harold W., Captain, Lebanon, 107th Field Artillery, Indiantown Gap, Pa.
SIEGEL, John M., 1st Lieut., Butler, 112th Infantry, Indiantown Gap.
SIGMOND, Henry I., Major, Philadelphia, 103d Engin., Indiantown Gap.
SKINNER, William F., Captain, Easton, 213th Coast Artillery, Camp Pendleton, Va.
SRODES, William G., Major, Woodville, 107th Field Artillery, Indiantown Gap, Pa.
STAHR, Charles P., Colonel, Lancaster, 103d Medical Regiment, Indiantown Gap, Pa.
SWIFT, John E., Major, Scranton, 109th Infantry.
ULRICH, Samuel D., Captain, Philadelphia, 108th Field Artillery, Indiantown Gap, Pa.
WARD, Frederick W., 1st Lieut., Easton, 213th Coast Artillery, Camp Pendleton, Va.
WEEST, Harry W., Jr., Lieut. Colonel, Altoona, 110th Infantry, Indiantown Gap, Pa.
WEIGEL, John E., Captain, Pittsburgh, 176th Field Artillery, Fort Geo. G. Meade, Md.
WELCH, John G., 1st Lieut., Lancaster, 103d Medical Regiment, Indiantown Gap, Pa.
WHITE, William F., Captain, Wellsboro, 103d Medical Regiment, Indiantown Gap, Pa.

RHODE ISLAND

CRANE, George E., Captain, Providence, 243d Coast Artillery, Fort Adams, R. I.
DREW, Robert W., 1st Lieut., Warren, 103d Field Artillery, Camp Blanding, Fla.
EGAN, Thomas A., Capt., Providence, 118th Med. Regt., Camp Blanding.
GANNON, Charles H., Major, Providence, 118th Engineers.
GROVER, Morris L., Captain, Providence, 118th Medical Regiment, Camp Blanding, Fla.
HEALEY, James P., 1st Lieut., Central Falls, 118th Medical Regiment, Camp Blanding, Fla.
KEEGAN, George A., 1st Lieut., Providence, 118th Engineers.
KENT, Joseph C., Major, Pawtucket, 103d Fld. Artillery, Camp Blanding.
MARTIN, Thomas A., Captain, Providence, 103d Field Artillery, Camp Blanding, Fla.
MORAN, James B., 1st Lieut., Wallum Lake, 118th Medical Regiment, Camp Blanding, Fla.
NORMANDIN, Louis A., Jr., Lieut. Colonel, 118th Medical Regiment, Camp Blanding, Fla.
PIANKA, Wallace J., 1st Lieut., Providence, 118th Medical Regiment, Camp Blanding, Fla.
ROGELL, Harold I., Major, Providence, 243d Coast Artillery, Fort Adams, R. I.
SAYER, Edmund A., Captain, Providence, 152d Observation Squadron.
WILSON, Lloyd C., Major, Providence, State Staff.

SOUTH CAROLINA

BALL, Robert W., Captain, Columbia, 263d Coast Artillery, Camp Stewart, Ga.
BARRON, William T., Capt., Columbia, 118th Inf., Fort Jackson, S. C.
BISHOP, Walter G., Captain, Greenwood, 263d Coast Artillery, Camp Stewart, Ga.
BLALOCK, George R., Capt., Clinton, 178th Field Artillery, Fort Bragg.
BRABHAM, James C., 1st Lieut., Walterboro, 178th Field Artillery, Fort McClellan, Ala.
BUCHANAN, John C., Jr., Major, Winnsboro, 105th Quartermaster Regt.
CHAPPEL, Buford S., Capt., Columbia, 118th Inf., Fort Jackson, S. C.
COLEMAN, Marshall J., Captain, Darlington, 178th Field Artillery, Fort Bragg, N. C.
EPPS, George L., 1st Lieut., Newberry, 105th Quartermaster Regiment.
FOUCHE, James William, Captain, Columbia, 105th Quartermaster Regt.
HUTCHINSON, Manly E., Major, Columbia, 263d Coast Artillery, Fort Moultrie, S. C.
JOSEY, Allen I., Captain, Columbia, 263d Coast Artillery, Fort Moultrie.
MATTHEWS, Rudolph S., Captain, Columbia, 118th Inf., Fort Jackson.
MC GOWAN, Robert P., Major, Laurens, 178th Fld. Artil., Fort Bragg.
MILES, Louis S., Captain, Summerville, 118th Inf., Fort Jackson, S. C.
SCHAYER, Isadore, Major, Columbia, 118th Inf., Fort Jackson, S. C.

SOUTH DAKOTA

AULD, Merritt A., Captain, Yankton, 109th Quartermaster Regiment.
HANSEN, Harold F., Captain, Vermillion, 147th Field Artillery, Fort Ord, Calif.
JONES, John P., Captain, Mitchell, 109th Quartermaster Regiment.
MC CARTHY, Paul V., Major, Aberdeen, 109th Engineers, Camp Claiborne, La.
MC GONIGLE, James P., Captain, Rapid City, 109th Engineers, Camp Claiborne, La.
OVEN, Gordon S., Captain, Rapid City, 109th Engineers, Camp Claiborne, La.
SACKETT, Roy F., Major, Parker, State Staff.
WILLIAMS, Forrest E., Major, Wakonda, 147th Field Artillery, Fort Ord, Calif.

TENNESSEE

CLEMENTS, Claudius A., 1st Lieut., Whitwell, 181st Field Artillery, Camp Forrest, Tenn.
CULBERTSON, John A., 1st Lieut., Clarksville, 191st Field Artillery, Camp Forrest, Tenn.
FANCHER, James R., Captain, Chattanooga, 181st Field Artillery, Camp Forrest, Tenn.
FENN, Joseph W., Major, Nashville, State Staff.
HARRIS, Frank F., Major, Chattanooga, 181st Field Artillery, Camp Forrest, Tenn.
HELLMANN, Robert S., Capt., Jackson, 117th Inf., Fort Jackson, S. C.
HENDERSON, Raymond D., Major, Memphis, 115th Field Artillery.
HUEY, Ellis J., Captain, Memphis, 115th Field Artillery.
PATTERSON, Robert C., Jr., 1st Lieut., Nashville, 105th Observation Squadron, Fort Jackson, S. C.
SMITH, Moore J., Jr., Captain, Chattanooga, 181st Field Artillery, Camp Forrest, Tenn.
SUTHERLAND, Arthur J., Jr., Major, Nashville, 191st Field Artillery, Camp Forrest, Tenn.
TAYLOR, Alva R., Captain, Jackson, 117th Infantry, Fort Jackson, S. C.
THOMPSON, John R., Jr., Major, Jackson, 117th Inf., Fort Jackson.
YANCEY, Charles R., 1st Lieut., Nashville, 191st Field Artillery, Camp Forrest, Tenn.

TEXAS

ARCHER, James T., Jr., 1st Lieut., Houston, 111th Engineers.
BARTLETT, Henry L., Major, Houston, 124th Cav., Fort Brown, Texas.
BECK, John W. E. II., Lieut. Colonel, Austin, 11th Medical Regiment, Camp Bowie, Texas.
BEIRENS, Charles A., 1st Lieut., Houston, 141st Inf., Camp Bowie.
BRADY, Randle J., Captain, Houston, 124th Cavalry, Fort Brown, Tex.
BREWSTER, Clarence B., Major, Fort Worth, 111th Medical Regiment, Camp Bowie, Texas.
COLEMAN, Robert H., Major, Mineola, 144th Inf., Camp Bowie, Texas.
COOPWOOD, Joseph B., Captain, Lockhart, 141st Inf., Camp Bowie.
FARLEY, William W., 1st Lieut., Amarillo, 142d Inf., Camp Bowie.

FROST, Jack E., Major, DeKalb, 111th Medical Regiment, Camp Bowie.
 GIESECKE, Carl G., Captain, San Antonio, 133d Field Artillery, Camp Bowie, Texas.
 HARDY, John M., Captain, Gainesville, 111th Med. Regt., Camp Bowie.
 HARGIS, William H., Sr., Major, San Antonio, 133d Field Artillery, Camp Bowie, Texas.
 HARWOOD, George W., Jr., 1st Lieut., Dallas, 144th Inf., Camp Bowie.
 HAWK, Hiram P., Captain, Gainesville, 111th Med. Regt., Camp Bowie.
 HEFFNER, Edward A., Jr., Captain, Fort Worth, 111th Medical Regiment, Camp Bowie, Texas.
 HONEA, Thomas C., Major, Cleburne, 132d Fld. Artillery, Camp Bowie.
 HOPKINS, Y. Frank, Captain, Taylor, 143d Infantry.
 HOWERTON, Ernest E., Captain, San Antonio, 141st Inf., Camp Bowie.
 HUTCHINSON, William A., Major, Texarkana, 111th Medical Regiment, Camp Bowie, Texas.
 JERABECK, John D., 1st Lieut., Houston, 124th Cav., Fort Brown, Tex.
 JOHNSON, Malcolm L., 1st Lieut., Paris, 111th Medical Regiment, Camp Bowie, Texas.
 LANDERS, Gardner H., Captain, Batesville, Ark., 111th Medical Regiment, Camp Bowie, Texas.
 LASATER, Waldo B., Major, Mineral Wells, 112th Cavalry, Fort Clark, Texas.
 LATSON, Harvey H., Major, Amarillo, 131st Field Artillery.
 LETTEER, Clarence Ralph, Jr., 1st Lieut., San Antonio, Special Troops, 36th Division, Camp Bowie, Texas.
 LOVING, Dan H., Major, Amarillo, 142d Infantry, Camp Bowie, Texas.
 LUMPKIN, Samuel H., 1st Lieut., Amarillo, 131st Field Artillery.
 MATTHEWS, John L., Captain, San Antonio, Special Troops, 36th Division, Camp Bowie, Texas.
 MC GEE, Ellis B., Captain, New Boston, 111th Medical Regiment, Camp Bowie, Texas.
 MEYER, Paul R., Captain, Port Arthur, 111th Engineers.
 MILLER, Frank P., Captain, Austin, 131st Field Artillery.
 MOODY, Joe V., 1st Lieut., Dallas, 144th Infantry, Camp Bowie, Texas.
 MOORE, Simm H., Major, Houston, 111th Med. Regt., Camp Bowie.
 O'REILLY, John J., Colonel, Fort Worth, 111th Med. Regt., Camp Bowie.
 PARNLEY, Van S., 1st Lieut., Dallas, 142d Inf., Camp Bowie, Texas.
 PATE, Joe J., Captain, Paducah, 142d Infantry, Camp Bowie, Texas.
 PEDIGO, Paul C., Captain, Strawn, 112th Cavalry, Fort Clark, Texas.
 PICKENS, Jay W., Captain, Cleburne, 132d Field Artillery, Camp Bowie.
 PINNELL, Robert, 1st Lieut., Wichita Falls, 111th Medical Regiment, Camp Bowie, Texas.
 POPE, Fielding M., Captain, West, 143d Infantry.
 PORTER, John T., Captain, Texarkana, Ark., 111th Medical Regiment, Camp Bowie, Texas.
 PRIMER, Benjamin M., Major, Austin, 111th Med. Regt., Camp Bowie.
 RATHGEB, Irving R. Jr., 1st Lieut., Texarkana, Ark., 111th Medical Regiment, Camp Bowie, Texas.
 REEMTSMA, William, Captain, New Braunfels, 133d Field Artillery, Camp Bowie, Texas.
 ROSS, Abner A., Major, Brownwood, 141st Infantry, Camp Bowie, Tex.
 SCHMITT, Herherth S., Captain, Malakoff, 144th Inf., Camp Bowie, Tex.
 SHEFFIELD, Lloyd B., Captain, Dallas, 144th Inf., Camp Bowie, Texas.
 SLOAN, Roy C., Captain, Terrell, 144th Infantry, Camp Bowie, Texas.
 STAHL, Louis J., Major, Gonzales, 111th Engineers.
 WATT, Terrence N., 1st Lieut., Austin, 111th Quartermaster Regiment.
 WIESNER, William A., 1st Lieut., San Antonio, 133d Field Artillery, Camp Bowie, Texas.
 WILLIAMS, Charles R., Captain, Mineral Wells, 112th Cavalry, Fort Clark, Texas.
 WILLIAMS, William E., Jr., Major, Austin, 111th Quartermaster Regt.
 YATER, Tolbert F., Captain, Cleburne, 132d Fld. Artillery, Camp Bowie.

UTAH

BELNAP, Howard K., Captain, Ogden, 115th Medical Regiment, Camp San Luis Obispo, Calif.
 CLARK, John H., Captain, Vernal, 145th Field Artillery, Camp San Luis Obispo, Calif.
 CONROY, Francis R., Major, Ogden, 115th Medical Regiment, Camp San Luis Obispo, Calif.
 GOTTFREDSON, David B., Major, Richfield, 115th Engineers, Camp San Luis Obispo, Calif.
 JOHNS, Chester T., 1st Lieut., Ogden, 115th Medical Regiment, Camp San Luis Obispo, Calif.
 MAYO, John F., 1st Lieut., Salt Lake City, 222d Field Artillery, Camp San Luis Obispo, Calif.
 PRICE, Joseph L., 1st Lieut., Ogden, 115th Medical Regiment, Camp San Luis Obispo, Calif.
 SHARP, Harlow B., Captain, Salt Lake City, 222d Field Artillery, Camp San Luis Obispo, Calif.
 SHARP, John F., Major, Salt Lake City, State Staff.
 SNOW, Virgil C., 1st Lieut., Cedar City, 222d Field Artillery, Camp San Luis Obispo, Calif.
 WHITING, Quinn A., 1st Lieut., East Ely, Nev., 222d Field Artillery, Camp San Luis Obispo, Calif.

VERMONT

BOGLE, Bascom, Captain, Northfield, 172d Infantry, Camp Blanding, Fla.
 COOTEY, Sherwin A., Lieut. Colonel, Rutland, 118th Medical Regiment.
 DUNSMORE, Murray K., Major, St. Albans, 118th Quartermaster Regiment, Camp Blanding, Fla.
 FARMER, Henry M., Captain, Burlington, 172d Inf., Camp Blanding.
 FARMER, Howard J., 1st Lieut., St. Johnsbury, 172d Infantry, Camp Blanding, Fla.
 KENT, Fred S., Major, Burlington, 172d Infantry, Camp Blanding, Fla.
 SHELK, Joseph P., 1st Lieut., Bellows Falls, 172d Inf., Camp Blanding.
 SIMONDS, John R., 1st Lieut., Woonsocket, R. I., 118th Quartermaster Regiment, Camp Blanding, Fla.
 SOUTHWORTH, John D., Captain, Rutland, 118th Medical Regiment.

VIRGINIA

ALLISON, Robley C., 1st Lieut., Petersburg, 176th Infantry.
 BARROW, Frederick P., II, Major, Portsmouth, 111th Field Artillery, Fort George G. Meade, Md.
 BOWEN, Richard A., II, Major, Richmond, 176th Infantry.
 BROWN, Hugh B., Jr., 1st Lieut., Draper, 116th Inf., Fort Meade, Md.
 BUCKLEY, Millard R., Captain, Richmond, 111th Field Artillery, Fort George G. Meade, Md.
 DAVIS, Charles F., Jr., Captain, Roanoke, 246th Coast Artillery, Fort Story, Va.
 HURT, Holcombe H., Captain, Virginia Beach, 246th Coast Artillery, Fort Story, Va.
 HURT, Ira H., Major, Roanoke, 246th Coast Artillery, Fort Story, Va.
 JOHNSON, Garnett W., Captain, Danville, 104th Medical Regiment.
 LUSH, Lewis Chasteen, Major, Richmond, 176th Infantry.
 POWELL, Rupert W., 1st Lieut., Roanoke, 116th Infantry, Fort Meade.
 RISHER, John C., 1st Lieut., Lynchburg, 246th Coast Artillery, Fort Story, Va.
 RUFFIN, Herbert G., 1st Lieut., Arvonnia, 104th Medical Regiment.
 SOUTHWARD, Wilbur R., Jr., Major, Richmond, 104th Medical Regt.
 TRICE, Ernest T., Lieut. Colonel, Richmond, State Staff.
 WEAVER, Oswald M., 1st Lieut., Colony, 116th Infantry, Fort Meade.
 WHITE, Harry F., Major, Fishersville, 116th Infantry, Fort Meade, Md.

WASHINGTON

BAUGH, Floyd W., Major, Burlington, 116th Med. Regt., Fort Lewis.
 BEELER, George W., Colonel, Seattle, 116th Medical Regt., Fort Lewis.
 BENJAMIN, Mac B., Captain, Tacoma, 103d Anti-Tank Battalion, Fort Lewis, Wash.
 BENNER, Stanley R., Captain, Yakima, 161st Infantry, Fort Lewis.
 BINGHAM, Harvey D., Capt., Seattle, 205th Coast Artillery, Fort Lewis.
 BURNS, Francis J., Major, Spokane, 161st Infantry, Fort Lewis, Wash.
 CARTER, Ronald P., Captain, Seattle, 116th Medical Regt., Fort Lewis.
 COLE, Harold C., 1st Lieut., Seattle, 116th Medical Regt., Fort Lewis.
 FRANZ, Francis W., Captain, Seattle, 116th Medical Regiment, Fort Lewis, Wash.
 HALVORSEN, Clifford, Captain, Fort Steilacoom, 248th Coast Artillery, Fort Worden, Wash.
 HUNTER, Maxwell R., Captain, Olympia, 205th Coast Artillery, Fort Lewis, Wash.
 JOHNSON, Willis B., Captain, Everett, 161st Infantry, Fort Lewis.
 JONES, Scott S., Major, Tacoma, 248th Coast Artillery, Fort Worden.
 KAVENEY, Irving E., 1st Lieut., Port Angeles, 116th Medical Regiment, Fort Lewis, Wash.
 KLING, George W., Captain, Centralia, Special Troops, 41st Division, Fort Lewis, Wash.
 KYLE, Philip Collins, Major, Tacoma, 116th Quartermaster Regiment.
 LAIGE, Raymond, Captain, Seattle, 146th Field Artillery.
 LILLIBRIDGE, Harold D., Major, Olympia, 205th Coast Artillery, Fort Lewis, Wash.
 LINK, Richard B., Captain, Tacoma, 248th Coast Artillery, Fort Worden.
 MILLER, Richard R., Captain, Seattle, 116th Med. Regt., Fort Lewis.
 OSBORNE, Lester F., 1st Lieut., Tacoma, 116th Med. Regt., Fort Lewis.
 PARMELEE, Ernest B., Captain, Seattle, 116th Quartermaster Regt.
 TSAPRALIS, Paul Constantine, 1st Lieut., Seattle, 116th Medical Regiment, Fort Lewis, Wash.
 WHYTE, Kenneth G., Major, Seattle, 116th Med. Regt., Fort Lewis.

WEST VIRGINIA

BRICK, John P., 1st Lieut., Charleston, 150th Inf., Camp Shelby, Miss.
 CARNEY, Harry B., A., Captain, Charleston, 150th Inf., Camp Shelby.
 COPLIN, Robert W., 1st Lieut., Huntington, 150th Inf., Camp Shelby.
 EVANS, George T., 1st Lieut., Fairmont, 201st Infantry, Fort Benjamin Harrison, Ind.
 FORD, Joseph C., Captain, Huntington, 150th Inf., Camp Shelby, Miss.
 HARMAN, Robert D., Major, Kingwood, 201st Inf., Fort Harrison, Ind.
 LAMBERT, Luther R., Major, Fairmont, State Staff.
 POST, Donald M., Captain, Morgantown, 201st Inf., Fort Harrison, Ind.
 VAN METRE, Robert S., Major, Huntington, 150th Inf., Camp Shelby.

WISCONSIN

BECKER, Reinhard, Major, Milwaukee, 135th Med. Regt., Camp Shelby.
 BECKER, Walter T., Captain, Cederburg, 135th Medical Regiment, Camp Shelby, Miss.
 BLECKWENN, William J., Colonel, Madison, 135th Medical Regiment, Camp Shelby, Miss.
 BOXER, Leo M., Captain, Milwaukee, 135th Med. Regt., Camp Shelby.
 BROOKE, James W., 1st Lieut., Madison, 135th Medical Regiment, Camp Shelby, Miss.
 CHRISTIANSEN, Wilmer H., Captain, Milwaukee, 135th Medical Regiment, Camp Shelby, Miss.
 CHRISTIANSON, Herbert B., 1st Lieut., Superior, 128th Infantry, Camp Livingston, La.
 EAGLEBURGER, Leon S., Major, Waupun, 135th Medical Regiment, Camp Shelby, Miss.
 FEIN, Bernard T., 1st Lieut., Milwaukee, 127th Inf., Camp Beauregard.
 FERRIS, James W., Capt., Wausau, 107th Quartermaster Regiment, Camp Beauregard, La.
 GALLOGLY, John A., 1st Lieut., Milwaukee, 135th Medical Regiment, Camp Shelby, Miss.
 GRAB, John A., Major, Milwaukee, 135th Medical Regt., Camp Shelby.
 HATHAWAY, George J., Major, Superior, 128th Inf., Camp Livingston.
 HAUKOHL, Robert S., 1st Lieut., Milwaukee, 135th Medical Regiment, Camp Shelby, Miss.
 HEIDEN, Harry H., Major, Sheboygan, 107th Quartermaster Regiment, Camp Beauregard, La.
 HOLLENBECK, Stanley W., Major, Milwaukee, 126th Field Artillery.

HOLMES, John F., 1st Lieut., Milwaukee, 135th Medical Regiment, Camp Shelby, Miss.
KENDALL, Earl T., Captain, Racine, 135th Med. Regt., Camp Shelby.
LEVEROOS, Edward H., 1st Lieut., Superior, 128th Infantry, Camp Livingston, La.
MC CABE, John O., Capt., Milwaukee, 135th Med. Regt., Camp Shelby.
MC MAHON, Raymond A., 1st Lieut., Madison, 135th Medical Regiment, Camp Shelby, Miss.
MILLER, James E., Captain, Madison, 135th Med. Regt., Camp Shelby.
MORAN, Clement J., Captain, La Crosse, 120th Field Artillery, Camp Beauregard, La.
MUENZNER, Richard J., Jr., 1st Lieut., Milwaukee, 121st Field Artillery, Camp Beauregard, La.
MUSSER, Marc J., Jr., Major, Madison, 135th Med. Regt., Camp Shelby.
NEBEL, Harold, Major, Milwaukee, 121st Field Artillery, Camp Beauregard, La.
NOWACK, Louis W., Captain, Watertown, 127th Inf., Camp Beauregard.
PETERSON, John R., 1st Lieut., Milwaukee, 135th Medical Regiment, Camp Shelby, Miss.
PETERSON, Leo W., Lieut. Colonel, Sun Prairie, 135th Medical Regiment, Camp Shelby, Miss.
POHLE, Frederick J., Captain, Madison, 135th Med. Regt., Camp Shelby.
SCHRAMMEL, Anton J., Captain, Milwaukee, 120th Field Artillery, Camp Beauregard, La.
SCHWARZE, Cyril A., 1st Lieut., Watertown, 135th Medical Regiment, Camp Shelby, Miss.
SHIELDS, Herbert B., 1st Lieut., Milwaukee, 127th Infantry, Camp Beauregard, La.
THANOS, John N., 1st Lieut., Milwaukee, 135th Medical Regiment, Camp Shelby, Miss.
VETTER, Edward W., Capt., Randolph, 135th Med. Regt., Camp Shelby.
WEISSMILLER, Lester L., Captain, Madison, 135th Medical Regiment, Camp Shelby, Miss.
WILKINSON, Philip M., Captain, Oconomowoc, 135th Medical Regiment, Camp Shelby, Miss.
ZINTEK, Sylvester S., Major, Milwaukee, 127th Infantry, Camp Beauregard, La.

WYOMING

PENNOYER, Willard H., Captain, Cheyenne, 115th Cavalry, Fort Lewis.
RAE, Harold B., Major, Torrington, 115th Cavalry, Fort Lewis, Wash.

ALASKA

TOOHEY, Clarence J., Captain, Anchorage, State Staff.
VOLLERT, Edward F., Captain, Juneau, 297th Infantry.

HAWAII

AVAKIAN, Edward V., Captain, Pepeekeo, 299th Infantry, Schofield Barracks, Hawaii.
COCKETT, Patrick M., Captain, Wailuku, 299th Infantry, Schofield Barracks, Hawaii.
KONG, Raymond F., Captain, Honolulu, 298th Infantry, Schofield Barracks, Hawaii.
PANG, David L., Capt., Honolulu, 298th Inf., Schofield Barracks, Hawaii.
PHILLIPS, Clyde L., 1st Lieut., Hilo, 299th Inf., Schofield Barracks.
TESSMER, Carl F., Capt., Honolulu, 298th Inf., Schofield Barracks.
TONG, Fook H., Captain, Honolulu, 299th Infantry, Schofield Barracks.

PUERTO RICO

BUSO-CARRASQUILLO, Roberto, Captain, San Juan, 296th Infantry, Camp Tortuguero, P. R.
de DIEGO, Manuel, Captain, Ponce, 162d Field Artillery.
de la VEGA, Luis B., Major, Rio Piedras, State Staff.
GALLARDO, Jose A., 1st Lieut., San Juan, 295th Infantry.
GUZMAN, Manuel, Jr., Captain, Mayaguez, 296th Infantry, Camp Tortuguero, P. R.
JULIA, Carlos M., Captain, San Juan, 295th Infantry.
PASSALACQUA, Luis A., Captain, Ponce, 296th Infantry, Camp Tortuguero, P. R.
RAMIREZ, Ramon E., Captain, Mayaguez, 296th Infantry, Camp Tortuguero, P. R.
SILVA, Euripides, Major, San Juan, 296th Inf., Camp Tortuguero, P. R.

NONPERISHABLE FOOD FOR THE ARMY

The War Department has announced that continental United States will be divided into nine areas to facilitate the purchase, storage and distribution of nonperishable food for the Army. The nine quartermaster or general depots will be located at Boston, Chicago, San Francisco, Atlanta, Ga., Charlotte, N. C., New Orleans, San Antonio, Texas, Kansas City, Mo., and Jersey City, N. J., each depot to serve for this purpose various surrounding states. However, in the procurement of certain nonperishable foods, only three of the nine depots will be used. The Chicago depot will procure canned meats and will handle also canned vegetables, milk, dried eggs and wheat flour, except for the area served by the San Francisco depot, which will procure its own wheat flour. The San Francisco depot in addition will procure canned apricots, cherries, peaches, pears, pineapples and prunes; also canned asparagus and canned salmon. The Jersey City depot will procure canned apples, apple sauce, apple butter, coffee, canned grape fruit, jam, preserves, sugar, syrup, salt, tea and flavoring extracts. Among the items to be procured by each of the regional depots except Charlotte and Kansas City are canned blackberries, blueberries, loganberries, raspberries, canned sour cherries, canned cabbage, carrots, rice, sugar, spices, black pepper, vinegar, canned sardines, canned tuna fish, ground cinnamon, cocoa, gelatin and desserts, powders and peanut butter. Such items for the Charlotte area will be purchased by the Jersey City depot, and Kansas City will be furnished through the Chicago depot. Normally all of these items, with the exception of flour and green bean coffee, will be purchased f. o. b. at the army post, camp or station where they are to be used. If the carload shipment cannot be made, deliveries will be made to the regional depot, where they will be pooled with other items, when practicable, to make up carload lots.

YELLOW FEVER VACCINATIONS COMPLETED IN PUERTO RICO

Inoculation of the entire command at Puerto Rico against yellow fever has been completed without a single case of "unusual reaction," the War Department announced July 2. It was the largest mass yellow fever inoculation ever attempted in the history of the United States Army.

Decision to adopt this method of protecting troops in tropical regions against yellow fever authorized earlier this year grew out of the discovery by medical science of a jungle type of

the fever that has its reservoir of virus in wild life as contrasted with malaria which is transmitted only between human beings. It cannot be stamped out and immunization was adopted in order to protect soldiers against possible infection in tropical regions.

All military personnel stationed at posts in the tropical regions of the Western Hemisphere are being inoculated against yellow fever. Troops ordered to duty in these regions will be vaccinated before leaving the states.

The yellow fever vaccine used by the Army consists of a special strain of yellow fever virus that has been attenuated through prolonged cultivation in tissue cultures by the Rockefeller Institute for Medical Research, New York. Extreme care is necessary in the packing and shipping of the vaccine, since it must be carried in containers in which the temperature does not exceed 39.2 F.

INDUSTRIAL HYGIENE IN DEFENSE INDUSTRIES

Approximately \$250,000 is to be made available to the Division of Industrial Hygiene of the National Institute of Health for the 1942 fiscal year in order to continue the industrial hygiene activities in defense industries which were initiated on March 1 of this year. This amount, plus the regular appropriation of the division, will bring the entire budget for industrial hygiene in the Public Health Service close to \$500,000. At present there are 106 persons engaged in this work, of whom 17 are physicians, 16 are engineers, 32 are chemists, toxicologists and physicists, and 41 are subprofessional and clerical workers. There are now 32 professional persons engaged directly in field activities in defense industries. This group consists of 12 physicians, 15 engineers, 4 chemists and 1 nurse. It is planned to increase this mobile field group in order to satisfy the demands for personnel in the states.

CANADIAN DOCTORS FOR BRITAIN

Arrangements have been completed between the British Red Cross and the Canadian Red Cross to send Canadian physicians to Britain. The project is comparable to the one which is sending American physicians to aid Britain. Fifty Canadian physicians are now ready to sail and more will follow, depending on transport facilities.

ORGANIZATION SECTION

OFFICIAL NOTES

ADDRESSES BY OFFICIAL STAFF

DR. W. W. BAUER:

August 20—National Medical Association, Chicago.

DR. MORRIS FISHBEIN:

August 1, 10:30 p. m. eastern daylight saving time—Listen America, Radio Station WEA, Red Network of the National Broadcasting Company.

August 18—National Association Boards of Pharmacy and American Association Colleges of Pharmacy, Detroit.

August 25—Rotary Club, Toledo, Ohio.

DR. PAUL A. TESCHNER:

August 26—Teachers' Institute, Vincennes, Ind.

August 27—Teachers' Institute, Washington, Ind.

EXHIBITS FROM HEADQUARTERS

August 1-30.—County Fairs, California (in cooperation with California Medical Association):

The Respiratory System in Health and Disease.
Heart Disease.
Dangers of Self Diagnosis and Self Medication.
"Patent Medicine" Testimonials.

August 1-28.—County Fairs, Nebraska (in cooperation with Nebraska State Department of Health):

The Human Factory.
Prevention of Accidents.
Prevention of Burns.

August 1-30.—Toledo Museum of Science, Toledo, Ohio (in cooperation with Medical Society):

Medical Discoveries of a Century.

August 1-30.—Grand Rapids Public Museum, Grand Rapids, Mich. (in cooperation with Kent County Medical Society):

Heroes of Medicine.

August 1-30.—Cleveland Health Museum, Cleveland:

Your Bones and Muscles.

August 4-9.—Tri-State Fair, Burlington, Iowa (in cooperation with Des Moines County Health Unit):

The Public Health.

August 5-11.—Northern Wisconsin District Fair, Chippewa Falls, Wis. (in cooperation with Medical Society):
Periodic Health Examinations.

August 7-10.—Ramsey County Fair, White Bear, Minn. (in cooperation with Minnesota Society for the Prevention of Blindness):

Prevention of Eye Injuries.

August 9-17.—Illinois State Fair, Springfield, Ill. (in cooperation with Illinois State Department of Public Health):

Cancer.
Tularemia.

August 11-14.—Rock County 4-H Fair, Janesville, Wis. (in cooperation with Rock County Sanitary Unit):

The Human Factory.
Posture.

August 17-23.—American Pharmaceutical Association, Detroit (annual meeting):

Use and Abuse of Barbiturates.
Chemistry of the Sulfonamides.

August 18-23.—National Medical Association, Chicago (annual meeting):

Information About Syphilis.

August 24-30.—Minnesota State Fair, St. Paul (in cooperation with Minnesota Society for the Prevention of Blindness):

Prevention of Eye Injuries.

August 27-30.—National Woman's Christian Temperance Union, Grand Rapids, Mich. (annual meeting):

"Patent Medicines."

August 31-September 5.—Nebraska State Fair, Lincoln (in cooperation with Nebraska State Medical Society and Nebraska State Department of Health):

Information About Health.
The Human Factory.
Periodic Health Examinations.
Prevention of Accidents.
The Public Health.
Information About Syphilis.
Prevention of Burns.

August 30-September 5.—Indiana State Fair, Indianapolis (in cooperation with Indiana State Medical Society):

Cancer.
Tularemia.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 415 has passed the Senate, providing pensions to members of the Regular Army, Navy, Marine Corps and Coast Guard who become disabled by reason of their service, equivalent to 90 per cent payable to war veterans for similar service connected disabilities. S. Res. 128 has been agreed to, directing the Railroad Retirement Board to make an immediate, thorough and complete investigation of the incidence of injuries and diseases incurred by employees through employment in the railroad industry and the social and economic consequences of such injuries and diseases, and to report to the Senate Committee on Interstate Commerce at the earliest practicable time the results of its investigation. H. R. 4476 has passed the House, providing for sundry matters affecting the Military Establishment. This bill includes an authorization under which the Secretary of War may provide for the "employment of interns who are graduates of or have successfully completed at least four years' professional training in reputable schools of medicine or osteopathy in the Medical Department, at not to exceed \$720 per annum."

Bills Introduced.—S. 1711, introduced by Senator Reynolds, North Carolina, proposes to amend an act to provide for the promotion of vocational rehabilitation of persons disabled in industry or otherwise by making the act applicable "to any person inducted into the land or naval forces of the United

States under the provisions of the Selective Training and Service Act of 1940 or ordered into the active military service of the United States under the provisions of the joint resolution of Aug. 27, 1940, as amended, who is disabled as the result of any injury sustained or disease contracted while in the military or naval forces of the United States." S. 1784, introduced by Senator Wheeler, Montana, proposes to enact a federal workmen's compensation act by providing compensation for disability or death resulting from injury to employees of contractors on public buildings and public works and to employees employed at places subject to the exclusive jurisdiction of the United States. The benefits of the Longshoremen's and Harbor Workers' Compensation Act would be made applicable, with certain limitations, to the employees covered by the pending bill. H. J. Res. 206, introduced by Representative Weiss, Pennsylvania, provides that the Civil Service Commission shall accept a report of the physical condition of any disabled war veteran made by any licensed physician on the basis of the examination given the disabled war veteran "within the last thirty days." H. R. 5414, introduced by Representative Jarman, Alabama, proposes an annual appropriation not to exceed \$600,000,000 to provide for the health and welfare of children and to contribute to the future national defense by providing all children of the United States, of the age of 14 or less, with an adequate supply of wholesome milk.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

Navajo Clinical Conference.—The sixth Harlow Brooks Memorial Navajo Clinical Conference will be held at the Sage Memorial Hospital, Ganado, August 25-27. The following program has been announced:

- Dr. Chevalier L. Jackson, Philadelphia, Cancer of the Esophagus.
- Dr. James P. Rigg, Grand Junction, Colo., Upper Respiratory Foreign Bodies.
- Dr. Clarence E. Rees, San Diego, Modified Technic for Amputation of the Lower Third of the Femur.
- Dr. Louis F. Bishop Jr., New York, Harlow Brooks.
- Dr. E. Payne Palmer, Phoenix, Recent Advances in Carcinoma.
- Dr. Franklin I. Ball, Los Angeles, Mucous Membrane Lesions.
- Dr. William W. Hutchinson, Los Angeles, Cyclopropane, a Safe and Effective Anesthetic.
- Dr. Rupert B. Rancy, Los Angeles, Technical Advances Having a Favorable Influence on Morbidity and Mortality from Intracranial Surgery.
- Dr. Forrest N. Anderson, Los Angeles, Some Mental Viewpoints on Children's Problems.
- Dr. Arthur S. Risser, Blackwell, Okla., The Finite in Medical Practice and Its Relation to the Infinite.
- Dr. William H. Daniel, Los Angeles, Benign and Malignant Tumors of the Lower Colon.
- Dr. Edwin Forrest Boyd, Los Angeles, Why Laugh?
- Dr. Steele F. Stewart, Los Angeles, Tenosynovitis.
- Dr. Newell Jones, Los Angeles, The Problem of Nutritional and Other Developments in Childhood.
- Dr. Alfred E. Gallant, Los Angeles, Some Observations from Orthopedic Examinations of Men Under the Selective Service Act.
- Dr. Tracy O. Powell, Los Angeles, Urological Problems in Children.
- Dr. Buell H. Sprague, Los Angeles, Hypoglycemia.
- Comdr. Joseph Madison Greer, Phoenix, medical corps, U. S. Naval Reserve, Surgery in the United States Navy.

CALIFORNIA

Lectures on Ophthalmology.—Dr. William Thornwall Davis, Washington, D. C., lectured before the Los Angeles Society of Ophthalmology and Otolaryngology, July 26, on "Differential Diagnosis of Squint and the Phorias with Particular Reference to the Value of Orthoptic Training"; "Treatment of Accommodative Squint," and "Disorders of Vertical Motility."

Postgraduate Courses.—Stanford University School of Medicine, San Francisco, announces a series of postgraduate medical courses for practicing physicians to be given in cooperation with the city department of health and the San Francisco Hospital, September 8-12. Each physician may take one morning and one afternoon course, or a full day course, and all physicians are urged to attend the evening general meetings. Morning courses will cover gynecology, medical diagnosis and treatment and diseases of the genitourinary tract, and afternoon courses the diagnosis and treatment of malignant tumors, cardiovascular diseases and surgical anatomy and operative technic. Full day courses will be on surgical emergencies, traumatic injuries and fractures, ophthalmology and anesthesiology. The evening meetings will be addressed by:

- Dr. William H. Northway, Use of Physical Therapy in Modern Medicine.
- Drs. Hale F. Shirley and Mary H. Layman, Behavior Problems in Pediatric Practice.
- Drs. Rodney R. Beard, Nelson J. Howard and William P. Shepard, Everyday Problems in Industrial Medicine.

CONNECTICUT

Laboratory Technician Wanted.—An examination to fill the position of laboratory technician in a state laboratory will be held orally on August 25, and if a written examination is deemed necessary it will be held the same day. Applications must be filed by August 12. Candidates may offer not less than three years of experience in technical laboratory work or graduation from college with a course of study which included courses in chemistry and biology and not less than six months of experience in technical laboratory work; or graduation from high school and completion of an approved training course as a laboratory technician; or a satisfactory equivalent combination of experience and training. Candidates should have knowledge of standard laboratory practices, technics, equipment and terminology; ability to carry out detailed written and oral instructions; ability to keep standard laboratory records and to prepare reports of tests and examinations. The Connecticut residence

is waived for this position, but candidates must be citizens of the United States. Entrance salary will be \$1,440 annually less maintenance, with the maximum to be \$1,860 annually less maintenance. Additional information may be obtained from the Personnel Department, State of Connecticut, State Capitol, Hartford.

ILLINOIS

New Medical Director of Industrial Commission.—Dr. Martin G. Luken, Chicago, has been appointed medical director for the Illinois Industrial Commission. Dr. Luken, a graduate of the University of Illinois College of Medicine, Chicago, was health officer of Chicago from 1906 to 1910. He is on the staff of St. Elizabeth's, Cook County and the Angel Guardian Orphanage hospitals. He succeeds Dr. Andrew Cosmas Garvy, Chicago.

Advisory Committee on Public Assistance.—At the request of the division of public assistance of the state department of public welfare the Illinois State Medical Society recently appointed a committee on medical care of public assistance recipients. Those appointed were Drs. Charles H. Phifer, Chicago, chairman; Harold M. Camp, Monmouth, secretary; Everett P. Coleman, Canton; Julius H. Hess, James H. Hutton and John R. Neal, Chicago. Dr. Edwin S. Hamilton, Kankakee, has been appointed to succeed Dr. Neal, who died July 1.

Poliomyelitis in Illinois.—Of the 56 cases of infantile paralysis reported in Illinois from the first of the year up to July 24, 26 occurred in Cook County and 30 downstate, the state department of health has announced. In a statement to the press, July 24, the department reported that only 3 new cases had been recorded during the first half of the week. In 1937, the peak epidemic year, it was exactly at this season that the number of cases mounted with totals of from 26 to 32 cases reported each week. A conference to outline a program of research work in infantile paralysis was held at the headquarters of the American Medical Association July 22, attended by local health authorities and representatives of the state department of health.

Chicago

Society News.—The Chicago Urological Society was addressed recently by Drs. Robert H. Herbst and James W. Merricks on "The Pathology of Vesical Neck Obstructions in the Female"; Leander W. Riba, "Chronic Urethritis in Women," and Russell D. Herrold, "Observations on the Use of Stilbestrol in Urology." Dr. Norris J. Heckel was chosen president of the society and Dr. Charles G. Weller, Aurora, vice president. Dr. Irving J. Shapiro is the secretary-treasurer.

Personal.—Dr. Anton J. Carlson, Frank P. Hixon distinguished service professor emeritus of physiology, University of Chicago, delivered the commencement address at the Massachusetts Institute of Technology on June 8.—Dr. James B. Herrick has been elected an honorary member of the Cardiac Society of Great Britain and Ireland.—Dr. Louis Leiter has resigned as associate professor of medicine at the University of Chicago, The School of Medicine, and has been appointed an attending physician at Michael Reese Hospital.

Postgraduate School of Tuberculosis.—Plans have been announced for the establishment of a Postgraduate School of Tuberculosis to offer two courses a year. It is expected that the school will be opened in October and may be held at any of the eight clinics of the Chicago Municipal Tuberculosis Sanitarium, a hospital or other location designated by the enrollees. Any branch or group supplying twenty or more enrolments can have the school established for their benefit at any suitable location and time convenient to the enrollees. The first twenty enrolments received will be given preference. The applications will be classified into "full registration groups," and the school will rotate from district to district following the sequence of the registrations. The plan to create the school was worked out by a committee of physicians and the board of directors of the Municipal Tuberculosis Sanitarium. Applications should be directed to the central office of the Sanitarium, 2049 Washington Boulevard.

INDIANA

Hospital News.—The new \$1,000,000 "Silver Crest" Southern Indiana Tuberculosis Hospital was formally dedicated at New Albany recently. The hospital, which receives patients from forty southern Indiana counties, has a capacity of one hundred beds. Dr. Jerome V. Pace is superintendent.

Society News.—Dr. Paul B. Magnuson, Chicago, discussed "Treatment of Arthritis from the Standpoint of the General Practitioner" before the La Porte County Medical Society,

La Porte, June 19.—The Tippecanoe County Medical Society was addressed in Lafayette, June 10, by Dr. George B. Eusterman, Rochester, Minn., on diagnosis and treatment of chronic peptic ulcer and gastritis.—Dr. Carl P. Huber, Indianapolis, addressed the Pike County Medical Society, Petersburg, July 10, on obstetrics.—William Crawford, D.D.S., Indianapolis, addressed the Dearborn-Ohio County Medical Society, Dillsboro, June 5, on "Medicine and Dentistry."

KENTUCKY

Society News.—The Four County Medical Society, composed of Caldwell, Lyon, Trigg and Crittenden counties, held a pediatric conference at its quarterly meeting in Princeton, July 8, with Drs. Philip F. Barbour and Lee Palmer, Louisville, as guest speakers. Dr. Barbour discussed "Abdominal Pain in Children" and Dr. Palmer "Diarrhea and Dysentery."

Epidemic of Shiga Dysentery.—The American Red Cross has established a twenty-five bed emergency hospital in a school building at Columbia, Adair County, to serve as an isolation unit in an epidemic of Shiga dysentery. About 100 cases have been reported with twelve deaths. Children are the chief victims, it was said. The emergency hospital was set up on the recommendation of Dr. Lydia B. Edwards, Baltimore, who made a survey for the Red Cross and state health authorities. Houses will also be quarantined in an effort to curb the disease. A staff of seven Red Cross nurses and one Red Cross doctor and five additional nurses is being recruited in the vicinity, according to an announcement from the Red Cross.

LOUISIANA

Personal.—Drs. Joseph O. Weillbaechler Jr. and Charles B. Odom, who until recently had been acting director and assistant director, respectively, of Charity Hospital, New Orleans, were guests at a banquet in their honor given by members of the staff. They resigned to enter private practice.

Graduate Course in Tropical Medicine.—The department of graduate medicine, Tulane University of Louisiana School of Medicine, New Orleans, announces a graduate course in tropical medicine and medical parasitology. The course will consist of lectures, conferences, quizzes, practical laboratory work and demonstrations, together with the study of clinical cases, with about half of the time devoted to diagnosis and management of disease. The course will begin each fall in September with the opening of the medical school and extend through the first half of the school year. It is open to properly qualified American physicians and adequately trained physicians in Latin America and other parts of the world. Additional information may be obtained from the Director, Department of Graduate Medicine, Tulane University of Louisiana School of Medicine, 1430 Tulane Avenue, New Orleans.

MAINE

State Medical Election.—Dr. Carl H. Stevens, Belfast, was chosen president-elect of the Maine Medical Association at its annual meeting in York Harbor, June 22-24, and Dr. Penry L. B. Ebbett, Houlton, was inducted into the presidency. Dr. Frederick R. Carter, Augusta, is the secretary-treasurer and business manager.

State Board Changes.—Dr. Franklin A. Ferguson, Portland, was elected chairman of the state board of registration in medicine at the July meeting and Dr. Adam P. Leighton, Portland, secretary. Dr. Magnus F. Ridlon, Bangor, was recently appointed a member to succeed Dr. George R. Hagerthy, Bar Harbor, whose term expired.

Society News.—Dr. Siegfried J. Thannhauser, Boston, addressed the Aroostook County Medical Society in Houlton, June 10, on "X-Ray Therapy in Treating Skin Diseases and Super Growths."—Dr. Gilbert E. Haggart, Boston, addressed the Piscataquis County Medical Society, Greenville, July 24, on "Low Back Pain with Special Reference to Herniation of Intervertebral Disks."

MICHIGAN

Honorary Memberships Conferred.—The Wayne County Medical Society recently conferred honorary membership on three persons for outstanding service in their respective fields: Roy C. Gamble, portrait artist; Gustavus D. Pope, for twenty-one years a member of the board of commissioners of the Detroit Department of Health and since 1917 chairman of the Detroit chapter of the American Red Cross, and Milton S.

Van Geison, president of the Michigan Association of Superintendents of the Poor and director of the Flint Public Welfare Board.

New Center for Study of Brain.—Announcement has been made of the establishment of the Wayne University Brain Disease Registry at Wayne University College of Medicine, Detroit, in cooperation with seventeen hospitals in the Detroit metropolitan area. The center will be under the auspices of the department of pathology at the university and under the direction of Dr. Gabriel Steiner, professor of neurology and neuropathology. It is planned to make the facilities of the brain registry available to physicians and other scientists without charge. According to newspaper reports, its services will include storage of tissue specimens for examination and study, reports and statistics on the examined cases, teaching and demonstration facilities, publications and neuropathologic research.

Changes in Health Officers.—Dr. Alexander Witkov, Brooklyn, has been placed in charge of the health unit in Dickinson County, succeeding Dr. Edwin H. Place, now of Montgomery, Ala., resigned.—Dr. Vida H. Gordon, Lansing, has been appointed director of the Sanilac County health department, effective June 2.—Dr. Clifford C. Corkill, Menominee, was to resume his position as director of the Menominee County health department June 1 after a nine months leave of absence to study for a master's degree in public health at Johns Hopkins University School of Hygiene and Public Health. Dr. Buell H. Van Leuven, Petoskey, who was acting director during Dr. Corkill's absence, is now director of the Grand Traverse County health department.—Dr. August C. Orr, Newberry, resigned as director of the Luce-Mackinac district health department recently to enter private practice in Bismarck, N. D.—Dr. Nelson J. Robbins, Negaunee, has been named city health officer. During the thirty-seven years Dr. Robbins has practiced in Negaunee, he has served four terms as mayor and several years as health officer.

MINNESOTA

Hospital News.—An expansion program, to be worked out over several years at an ultimate cost of between \$150,000 and \$200,000, is under way at St. Joseph's Hospital, St. Paul. Recently the hospital acquired the Capitol Annex, an apartment building at St. Peter and Exchange streets, and a tract with an 80 foot frontage on Tenth Street adjoining the hospital properties on that street.

Society News.—Dr. Gustaf T. Nordin, Minneapolis, was elected president of the Minnesota Radiological Society at its annual meeting in St. Paul, May 27; Dr. Arthur U. Desjardins, Rochester, vice president, and Dr. John P. Medelman, St. Paul, was reelected secretary.—Major Harry G. Armstrong, flight surgeon, medical corps, U. S. Army, gave a Mayo Foundation lecture in Rochester, July 1, on "Recent Advances in Aviation Medicine."

MISSOURI

Personal.—Dr. Ernest Sachs, professor of clinical neurologic surgery, Washington University School of Medicine, St. Louis, has been elected an honorary member of the Royal Society of Medicine of England.—Dr. James W. Chapman, Jefferson City, was recently chosen president of the Missouri Public Health Association.

New Health Officers.—Dr. Edward G. McGavran, health officer of Monongalia County, W. Va., and director of a health training center of the state health department at Morgantown, has been appointed health officer of St. Louis County. He succeeds Dr. Theodore R. Meyer, who had served since 1936. Dr. Meyer has entered active service in the U. S. Navy at Corpus Christi, Texas.

NEW JERSEY

Personal.—Dr. George O'Hanlon, medical director of the Jersey City Medical Center, has been appointed medical director of all public hospitals in Hudson County, by action of the Hudson County freeholders and the city commission of Jersey City. The action was taken under the authority of a new state law allowing first class cities and first class counties to appoint a medical director for all city and county hospitals. Dr. Samuel A. Cosgrove, director of Margaret Hague Maternity Hospital, Jersey City, has been appointed deputy director.—Dr. Clarence W. Way, Sea Isle City, secretary of the Cape May County Medical Society, a major in the U. S. Army Medical Reserve Corps, has been ordered to active duty at Fort Dix.

NEW MEXICO

State Medical Election.—Dr. Wallace P. Martin, Clovis, was chosen president-elect of the New Mexico Medical Society at the annual meeting in Raton, May 26, and Dr. Carl Mulky, Albuquerque, was installed as president. Dr. Joseph E. J. Harris, Albuquerque, was elected vice president. The next annual session will be held in Santa Fe.

NEW YORK

Society News.—Dr. James H. Flynn, Troy, was elected president of the New York State Health Officers Association at the annual meeting, June 25; Drs. Myron M. Metz, Williams-ville, William H. Ruicic, Freeport, and John R. MacElroy, Jonesville, were elected vice presidents, and Dr. Russell H. Wilcox, Tonawanda, was made secretary.—Dr. Robert R. Linton, Boston, addressed the Saratoga County Medical Society at the Saratoga Spa, June 19, on "Diagnosis and Treatment of Peripheral Vascular Disease."—Drs. Lucius A. Wing and Joseph E. J. King, New York, addressed the Chemung County Medical Society, Elmira, in June on "Recent Advances in Obstetrics" and "Head Injuries" respectively.

Bacillary Dysentery in a Nursing Home.—An outbreak of bacillary dysentery (Sonné) in a nursing home in Suffolk County is reported in *Health News*, July 21. The outbreak began in the babies' ward and then spread to other parts of the institution, affecting 60 of the 275 inmates. Six of the 38 babies died. A diet kitchen in the babies' ward prepared formulas for the children. It was believed that opportunity for contamination existed in the handling of this formula. Another clue was found in the mother of one of the children who visited the home the day before the outbreak. The woman lived in a home near the institution for a two day visit and during that time complained of diarrhea, it was said. Epidemiologic investigation was still in progress.

New York City

Presbyterian Hospital to Benefit from Bequest.—The late Arthur Curtiss James, railroad industrialist, bequeathed nearly eight tenths of his extensive estate for the establishment of the James Foundation, the income of which is to be used to aid various charitable, educational and religious institutions. The fund is to be divided into twenty-eight shares, of which Presbyterian Hospital is to receive two shares, according to the will.

Honorary Degrees.—Dr. John J. Moorhead, consulting surgeon, New York Post-Graduate Hospital, and Dr. George B. Wallace, professor of pharmacology and director of the pharmacologic laboratories, New York University College of Medicine, received the honorary degree of doctor of science at the commencement of New York University. The doctorate of public health was conferred on Drs. William E. Caldwell, professor of clinical obstetrics and gynecology at Columbia University College of Physicians and Surgeons, and Frederick C. Holden, professor emeritus of obstetrics and gynecology, New York University College of Medicine.

Faculty Changes at New York Medical College.—Dr. Loudon Corsan Reid, assistant professor of pathology at New York Medical College, has been transferred to the department of physiology. Dr. Stephen P. Jewett, professor of psychiatry, has been made head of a new department of psychiatry and Dr. Thomas I. Hoen, professor of neurosurgery, head of the department of neurology and neurosurgery. Dr. Joseph H. Fobes, professor of surgery, has been placed in charge of graduate surgery and Dr. Louis Rene Kaufman, professor of surgery, in charge of undergraduate surgery. Dr. Reuel A. Benson, professor of pediatrics, now has the title of Helen S. Case professor of pediatrics.

NORTH CAROLINA

Personal.—Dr. William Redin Kirk, Hendersonville, celebrated his fiftieth anniversary in the practice of medicine, June 19.—Dr. William G. Cheves, Bunn, has been appointed medical director of the state prison system and Dr. Benjamin J. Lawrence, Raleigh, prison surgeon.—Dr. Len D. Hagaman, Boone, has been appointed health officer of Caldwell and Burke counties to succeed Dr. Wesley G. Byerly, Lenoir, who resigned because of ill health.

District Meeting.—The Tenth District Medical Society held its spring meeting in Waynesville recently with Dr. Oscar L. Miller, Charlotte, as the guest speaker on "Elbow Injuries, Particularly Those Fractures in Which Immediate Open Operation Is Indicated." Other speakers included Drs.

Daniel L. Smith Jr., Spartanburg, S. C., on "Recent Advances in Infant Nutrition"; Samuel L. Crow, Asheville, "Diagnosis and Treatment of Cardiac Emergencies," and James S. Brown, Hendersonville, "Patience in Obstetrics."

NORTH DAKOTA

State Medical Election.—Dr. Alfred R. Sorenson, Minot, was named president-elect of the North Dakota State Medical Association at the annual meeting in May at Grand Forks and Dr. Frederick W. Fergusson, Kulm, became president. Drs. Frank I. Darrow, Fargo, and Arne O. Arneson, McVillage, were elected vice presidents and Dr. Leonard W. Larson, Bismarck, was reelected secretary. The 1942 meeting will be in Jamestown.

OHIO

Personal.—Dr. Carl J. Wiggers, Cleveland, received the honorary degree of doctor of science from the University of Michigan at the commencement, June 21.—Dr. James W. Rowe, at various times demonstrator in histology, instructor and adjunct professor of obstetrics and assistant professor of gynecology at the University of Cincinnati College of Medicine, was honored at a testimonial dinner recently. About one hundred and fifty physicians attended and presented Dr. Rowe with a painting.

Society News.—Officers of the Alumni Association of the University of Cincinnati College of Medicine elected at the recent annual meeting are Drs. Daniel C. Rivers, president; Irving H. Schroth, vice president, and Helena T. Ratterman, secretary.—Drs. Arthur A. Brindley and Frederick W. Clement, Toledo, addressed the Auglaize County Medical Society, June 26, on "Spinal Anesthesia, Surgical and Therapeutic" and "Oxygen Therapy" respectively.—Dr. Donald M. Glover, Cleveland, discussed "Modern Treatment of Burns" before a joint meeting of the Miami and Shelby county medical societies in Sidney, June 12.—Dr. Henry Kennon Dunham, Cincinnati, was elected president of the Ohio Public Health Association at the annual meeting in Columbus, May 22.

SOUTH CAROLINA

Public Health Meeting.—Dr. Joseph E. Brodie, Greenwood, was named president-elect of the South Carolina Public Health Association at the recent annual meeting at Myrtle Beach, and Dr. Alva W. Humphries, Camden, became president. Speakers included Dr. Halbert L. Dunn, Washington, D. C., chief statistician for vital statistics, U. S. Bureau of the Census, on birth and death registration; Col. William H. Moncrief, medical superintendent of the South Carolina Sanatorium, State Park, on hospital facilities and treatment of tuberculosis in the state, and Dr. James G. Townsend, chief of the division of industrial hygiene, National Institute of Health, Bethesda, Md., on safeguarding the health of workers.

TENNESSEE

Poliomyelitis Increases.—Thirty cases of poliomyelitis have been reported in an outbreak in Franklin and Coffee counties, according to a newspaper dispatch, July 27. A report on July 24 said that three deaths had occurred. The U. S. Public Health Service has assigned a member of its staff to assist state health officers to curb the spread of the disease, it is reported.

WASHINGTON

State Medical Meeting in Seattle.—The fifty-second annual meeting of the Washington State Medical Association will be held in Seattle at the Olympic Hotel, August 24-27, under the presidency of Dr. Homer D. Dudley, Seattle. Washington physicians will present the scientific program on Tuesday and Wednesday. Morning sessions will be devoted to presentation of papers on general subjects; in the afternoons there will be panel discussions and symposiums. Among the papers will be:

- Dr. Leo J. Rosellini, Seattle, Practical Applications of Use of Large Quantities of Blood Plasma.
- Dr. Edwin G. Bannick, Seattle, General Status of Chemotherapy.
- Drs. Lester J. Palmer and George D. Capaccio, Seattle, Present Day Insulins.
- Dr. Roy J. Popkin, McChord Field, Diagnosis and Treatment of Peripheral Vascular Diseases.
- Dr. John C. Lyman, Walla Walla, Treatment of Chronic Massive Ulcerative Infections of the Skin with Zinc Peroxide.
- Dr. James M. Nelson, Spokane, Some Physiologic Aspects Relating to Surgery.

Subjects and chairmen of the symposiums will be: traumatic conditions, Dr. Raymond L. Zech, Seattle, Tuesday, and Dr. Robert D. Forbes, Seattle, Wednesday; heart conditions, Dr. Charles E. Watts, Seattle; infantile paralysis, Dr. Burton A. Brown, Tacoma, and diseases of ear, nose and throat, Dr. Har-

old LeRoy Goss, Seattle. Panel discussions will be held on head injuries, with Dr. Hale A. Haven, Seattle, as chairman; obstetrics, Dr. Richard D. Reekie, Spokane, chairman, and pediatrics, Dr. Jay I. Durand, Seattle, chairman.

WISCONSIN

State Board Election.—Dr. Donald R. Searle, Superior, was elected president of the Wisconsin State Board of Medical Examiners at a meeting in Milwaukee, June 26, and Dr. Robert E. Flynn, La Crosse, secretary.

Fifth District Meeting.—At a meeting of the Fifth Council District of the State Medical Society of Wisconsin in Sheboygan, June 12, the speakers included Drs. John M. Waugh, Rochester, Minn., on "Vaginal Hysterectomy"; Walter C. Alvarez, Rochester, "Puzzling Types of Abdominal Pain," and William S. Middleton, Madison, "Use and Abuse of Some Common Drugs." A symposium on cardiovascular disease was presented by Drs. Sherburne F. Morgan, Maurice A. F. Hardgrove, Howard L. Correll and Robert H. Feldt, all of Milwaukee. Following a banquet Dr. Ralph P. Sproule, Milwaukee, president of the state society, made an address and Dr. Alvarez spoke on "Why Women Get Nervous."

PUERTO RICO

Dr. Wegman Named Assistant Professor at School of Tropical Medicine.—Dr. Myron E. Wegman, since 1936 pediatric consultant of the bureau of child hygiene of the Maryland State Department of Health, Baltimore, is serving as assistant professor of child hygiene in the School of Tropical Medicine of the University of Puerto Rico, under the auspices of Columbia University, New York, and as assistant director of the division of education and research in charge of child hygiene in the insular department of health. Dr. Wegman's new work will include instruction in child hygiene for health officers and public health nurses and postgraduate instruction in pediatrics for physicians. He will also serve as consultant in pediatrics to the University Hospital and the Bayamon District Hospital and will carry on research in child hygiene and pediatrics. His headquarters will be at San Juan. Dr. Wegman served on the pediatric staff of the New Haven Hospital and Yale medical school from 1932 to 1936 and attended part time sessions at Johns Hopkins University School of Hygiene and Public Health, Baltimore, from 1936 to 1938, when he received the degree of master of public health. He has been lecturer in public health administration at the school of hygiene and public health, in charge of the course in child hygiene, during the last two years.

GENERAL

Ask Health Funds for Defense Areas.—Dr. Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C., told a committee of the House of Representatives studying defense migration, July 18, that an additional \$1,885,137,891 would be needed to provide health facilities in "preparedness areas," according to an Associated Press dispatch. Of this amount Dr. Parran said \$1,524,436,000 should be spent for housing and \$1,078,742,294 would be needed for medical care.

Appendicitis Death Rate Reduced.—The death rate from appendicitis among industrial policyholders of the Metropolitan Life Insurance Company has dropped from 14.4 per hundred thousand in 1929 to 8.9 in 1940, the company recently announced. The decrease was attributed to improved diagnostic and surgical technic, and to educational campaigns that have taught the public to seek prompt medical attention. It is believed that the greatest achievement of the campaigns has been in spreading the warning against taking laxatives in the presence of abdominal pain.

National Bowling Medical Group Formed.—Officers were elected for the American Medical Bowling Association during its first representative group meeting in Cleveland in June. Dr. Lewis Wine Bremerman, Los Angeles, was chosen president; Dr. James Robert Smith, Erie, Pa., vice president, and Dr. Maurice L. Allen, Cleveland, Ohio, secretary-treasurer. First place in this year's competition, the first, went to a team from Erie composed of Drs. Archie J. DeSantis, James R. Smith, Frank L. Mozdy, Donald D. Williams and Frank J. Theuerkauf. This team also placed first in the doubles, singles and the all events. The winning trophy was donated by Mead Johnson & Company, Evansville, Ind.

Report on President's Birthday Celebration for Poliomyelitis Campaign.—The National Committee for the Celebration of the President's Birthday made its report on the 1941 celebration to the President on July 23. The observances

of last January 30 raised a net total of \$2,104,460.53, which exceeded the amount raised in 1940 by \$697,214.79. The net proceeds will be divided between state and local chapters for direct relief to victims and the central organization for use in combating epidemics, in promoting research and in aiding hospitals and institutions in the study and treatment of the disease. State and local chapters will receive \$1,096,865.84 and the foundation \$1,007,594.69. Expenses of the campaign were reported as \$136,996.61, or 6.1 per cent of the total.

Special Society Elections.—Dr. Hunter H. McGuire, Winchester, Va., was named president-elect of the American Ophthalmological Society at the annual meeting, May 28, in Hot Springs, Va., and Dr. Allen Greenwood, Boston, was installed as president. The next annual session will also be at Hot Springs.—Dr. Thomas E. Carmody, Denver, was elected president of the American Laryngological Association at the annual meeting in Atlantic City, May 28, and Dr. Charles J. Imperatori, New York, was reelected secretary.—At the first annual meeting of the American Diabetes Association in Cleveland in June Dr. Herman O. Mosenhall, New York, was elected president; Drs. Joseph T. Beardwood, Jr., Philadelphia, and Joseph H. Barach, Pittsburgh, were elected vice presidents and Dr. Cecil Striker, Cincinnati, was made secretary.—Dr. Edwin T. Wyman, Boston, was elected president of the American Association of Medical Milk Commissions at the annual meeting in Cleveland, June 3, and Dr. Paul B. Cassidy, Philadelphia, was reelected secretary.—Miss Mary Louise Marshall, librarian of the Tulane University of Louisiana School of Medicine, New Orleans, was elected president of the Medical Library Association at the annual meeting recently in Ann Arbor, Mich. Dr. John F. Fulton, New Haven, Conn., was elected vice president and Miss Anna C. Holt, librarian of Harvard Medical School and the Harvard School of Public Health, Boston, was reelected secretary. The 1942 convention will be held in New Orleans.

LATIN AMERICA

Medicodental Meeting in Mexico.—The third medicodental convention organized by the Mexican Association of Orthodontia was held in Mexico City, June 23-28. Among physicians on the program were:

Dr. Henry Borsook, Pasadena, Calif., Vitamins in Prophylaxis and Therapy.
Dr. Ignacio Chavez, Mexico City, Dental Focal Infection and Cardiac Rheumatism.
Dr. Eberle Kost Shelton, Los Angeles, Endocrine Factors in Growth and Development.
Dr. Francisco de P. Miranda, Mexico City, Importance of Mineral Salts in the Diet of the Child and the Adolescent.
Dr. Antonio Torres Estrada, Mexico City, Improved Technic for Dacryocystorhinostomy.
Dr. Hermann Beck, San Francisco, Endocrinology.
Dr. Miguel E. Bustamante, Mexico City, General Hygiene and Dental Hygiene.

CANADA

Tuberculosis Meeting.—Dr. Duncan A. Carmichael, Ottawa, was named president-elect of the Canadian Tuberculosis Association at the annual meeting in Toronto in June and Dr. John H. Holbrook, Hamilton, became president. Dr. William Boyd, Toronto, was the guest speaker at a joint session with the Ontario Laennec Society on "Bronchogenic Carcinoma."

FOREIGN

Prize for Research in Encephalitis.—The foundation at the University of Berne, Switzerland, to promote research on encephalitis lethargica announces its annual prizes. Those who wish to compete should send their applications to the Dean of the Medical Faculty, which allocates the prizes at the end of each year.

Hospital in Scotland Named for Paderewski.—Funds are being collected for a Polish hospital in Edinburgh, Scotland, to be established in connection with a medical school as part of the Polish Medical Center in Edinburgh, which has been in operation since March, the New York Times recently reported. The hospital will be named the Paderewski Hospital in Edinburgh, in honor of the late Ignace Jan Paderewski, pianist and Polish premier. The hospital will be open to Polish civilian refugees, to Polish soldiers in Scotland and, in an emergency, to the British public. A total of \$20,000 has been sent from New York by the Paderewski Testimonial Fund for the hospital. A building has been made available by the city of Edinburgh, and the present drive is for a fund of \$50,000 to buy equipment. The fund in honor of Paderewski was started before his death as a tribute on the occasion of the fiftieth anniversary of his American debut.

Foreign Letters

LONDON

(From Our Regular Correspondent)

June 11, 1941.

The Destruction at the Royal College of Surgeons

The destruction by a German bomb of the larger part of the greatest medical museum in the world has been described in a previous letter. Further particulars can now be given. The lecture room, where discourses have been heard for a century from almost all the leaders of British surgery, is now a charred ruin. The main block of the library remains with books still on the shelves, but its state is too dangerous for use. Nearly ninety thousand volumes had been sent to various parts of the country after damage by blast from a previous raid. The transfer was aided by a grant from the Rockefeller Foundation. The principal treasures of the library had been sent away before the outbreak of the war. But the museum, which possessed treasures such as no other country could boast, has suffered irreparable loss, although many of the most valuable specimens were saved by having been placed in a tunnel below the basement surrounded with sand. The basement covers a wide area, and most of it escaped the fire that occurred. Many rooms, cellars and tunnels connected with it, which had been reinforced, were used for other specimens, which were not damaged. The important college records and historical documents had been sent away. But the working records dealing with the specimens, saved in the basement and subbasement, and the records of pathologic specimens presented to the college during the last few years were destroyed. The preservation of copies of the museum catalogues had been carefully considered and insured. All were saved except the catalogue of part of the pathologic section and that of the curio room, but nearly all the specimens in this room are described in the "Guide to Surgical Instruments and Objects in the Historical Series." Of the famous Hunterian collection, which forms the basis of the museum, no fewer than 3,750 specimens have been saved. Of the collections illustrating human anatomy only 20 specimens have been saved. Of 5,200 mammalian specimens illustrating comparative osteology only 20 or 30 remain and hardly any of 3,000 avian specimens or of the large amount of amphibian, reptile and aquatic material. The two rooms built in the middle of the last century, containing physiologic and comparative anatomy specimens, have been blasted away. Much anthropologic material has been destroyed, including the fine collection of primitive Tasmanian and Australian skulls. The greater part of the large collection of instruments is safe and can be restored. Among these are the instruments of Lister and of Moynihan, the Chinese and Japanese collections and the series illustrating the evolution of anesthetic apparatus. Though irreparable loss has been suffered, the destruction is not so great as was at first feared. Enough has been saved for the basis of a new museum, which will continue the Hunter tradition, which has always been fundamental in the college.

Changes Due to the War in National Health Insurance

The government has announced changes in the national health insurance scheme necessary to meet wartime conditions. It proposes to increase the sickness benefit for a man from \$4 to \$4.50 a week and his disablement benefit from \$2 to \$2.50. For single women and widows the new rates will be \$4 and \$2 respectively. These changes will be made possible by state grants on the usual basis and by increasing by 4 cents the weekly contributions payable in respect of each person, of which 2 cents will be borne by the employer and 2 cents by the insured person. The government also proposes to raise the income limit above which insurance is not compulsory for nonmanual workers from \$1,250 to \$2,120 per annum. This will increase

by nearly half a million the number of persons who will be entitled to medical treatment under the national health insurance scheme. The new position which will arise is being discussed with the medical profession. Power will be sought in the bill to be introduced to deal with the position in insurance of civilian prisoners of war and other similar war problems. The position of British prisoners who were rescued from the German raider *Altmark* is an example. Similar problems are arising in the course of the war.

Delay in Appointing to Hospitals Friendly Alien Physicians

There are in this country about fourteen hundred friendly alien physicians—seven hundred and fifty Germans, Austrians and Italians, two hundred and fifty Czechs and three hundred and fifty Poles. In January a statutory order was passed enabling alien physicians to be placed on a temporary register of the General Medical Council so as to be eligible for positions in hospitals and institutions. It was intended that the names submitted by various organizations should first be put before the Home Office for general permission to undertake such work. If approved, the names would be sent to the Aliens War Service Department and candidates for appointments would be finally selected by the Central Medical War Committee. The names would then be placed on the temporary register.

The machinery has worked very slowly. Since January only two hundred and fifty physicians have been approved by the Home Office and fewer than two hundred have been placed on the temporary register, and those who have obtained appointments have done so by answering advertisements in the press. But the government now seems alive to the importance of accelerating the process. These aliens are all refugees from totalitarian tyranny and anxious to help the Allied cause. Their dossiers have been for months with the Home Office, which has now agreed to deal with one hundred cases or more a week, but apparently the Aliens War Service Department can handle only fifty. If so, delay is inevitable. The slowness appears to be a question of adequacy of staff. The demand for physicians is so urgent that all obstacles should be removed. The great trouble is the possibility that among these aliens there may be enemy agents masquerading as friendly.

At a meeting of the Socialist Medical Association in London a resolution was passed protesting against "the government's failure to make use of the medical services of the anti-Fascist refugee doctors in this country." An immediate speed-up was urged. Mr. Somerville Hastings (laryngologist), president of the association, said that the state of affairs was more the fault of the government than of the British Medical Association. He had seen the Home Secretary twice on the matter and it had now been agreed to deal with one hundred applications weekly, but this rate was far too slow.

A New Use for Wounded Soldiers

In the House of Commons Mr. Churchill gave the reason why the mistake had been made of reporting officially that German parachutists landed in Crete in the uniforms of the New Zealand soldiers. After landing at one point the Germans drove a number of New Zealand walking wounded before them and along with them. It is well known that in the last war the Germans used civilians in this way in Belgium as a screen to protect their troops, but the use of wounded soldiers for this purpose appears to be quite new as a method of warfare.

Physician Bombed Out Four Times But Still Carries on

The London Insurance Committee commended a panel (national health insurance) physician who was bombed four times but was still carrying on. He had an office which was totally demolished last winter. He secured accommodations in the same street and six weeks later these premises were damaged beyond repair. Again he opened another office in the same

street, but this was demolished in the spring with all his furniture, drugs, bottles and medical records. His house in the neighborhood also was destroyed. He secured a fourth office in the same street and intimated to the committee his determination not to give up while a place remains. The committee sent him a message of sympathy and admiration.

BUENOS AIRES

(From Our Regular Correspondent)

May 22, 1941.

Congress for Care of Cardiac Patients

The Congress of the Asistencia Social del Cardíaco met in April in Buenos Aires to discuss problems relating to heart disease. Prof. Rafael A. Bullrich, professor of internal medicine in Buenos Aires, the chairman, pointed out that the stress of modern civilization greatly increases the morbidity and mortality from circulatory diseases. In the scientific sessions Bullrich discussed fundamental legislative points of view affecting social welfare of persons suffering from heart disease. He favored laws of social prophylaxis and welfare, recognition of cardiology as a medical and university specialty, a national ministry of public health and health records for school children from the time they entered school, and he stressed the need of old age pensions. He recommended the creation of dispensaries throughout Argentina for persons with heart disease and hospital colonies for the care and vocational training of children with heart disease. Dr. Luis González Sabathié of the University of Rosario said that the old methods of purely medical treatment in cardiac disorders were insufficient and that the quest for new therapies was stimulated by the recognition of the social significance of heart disease. Drs. José María Macera and Alberto Ruchelli, both pediatricians, recommended the establishment of special institutes for heart disease, such as are organized in the United States and Great Britain. They found that 8,500 school children (2.4 per cent) in Buenos Aires had heart disease. Of these, only 9.36 per cent received medical and hospital treatment. They also found that 0.64 per cent of all children in Argentina had asymptomatic primary heart disease, unrecognized at the time but disclosing itself subsequently. Dr. I. Urbandt discussed cardiovascular disturbances among industrial workers and recommended studies to determine activities suitable for affected industrial workers and regular periodic examinations. A considerable number of these workers could not be readjusted to other work. According to statistics, 70 per cent of revolutionists were persons who through physical disabilities, inclusive of heart disease, had become failures in life.

Resolutions were adopted requesting the government to legislate on social prophylaxis and welfare of patients with heart disease and to organize the medical care of such persons. Early diagnosis and long continuing treatments constitute the basis of social welfare for these patients. To this point of view the public needs to be educated.

Rheumatism in Children

In 1931 a cardiologic and rheumatologic division was organized in the Institute for Pediatrics in Buenos Aires to meet the increased incidence of rheumatic diseases in children and to enable their steady supervision. Its present director, Dr. A. Puglisi, recently reported on the activities of this institute. During the first ten months of 1940, 225 children, of whom only 6 were foreign children, were examined (122 boys and 103 girls). Fifty-two (23 per cent) of these children were hospitalized. The age level of these children varied between 3 and 16 years and was distributed as follows: 3 years 1, 4 years 7, 5 years 14, 6 years 18, 7 years 16, 8 years 29, 9 years 31, 10 years 24, 11 years 11, 12 years 18, 13 years 23, 14 years 20, 15 years 4, 16 years 1. The search for familial involvements showed that the father had heart disease in 9 cases and the mother in 16, a total of 11 per cent; likewise the father was

rheumatic in 15 cases and the mother in 32, representing a total of 20 per cent. One hundred and fifty-one of the 225 children presented articular rheumatism with cardiac complications. Of these, 76 (33 per cent) could be cured of the complications but remained rheumatic. Eight of the 76 were affected with chorea. Of the 151 with endocarditis, 27 (19 per cent) recovered; in 117 (77 per cent) the condition remained unmodified. Seven (4 per cent) died, 3 of septic endocarditis and 4 of asystole. Fifty-eight (76 per cent of the 76 rheumatic children without complications) regained health; no improvement was effected in 18 (24 per cent).

Marriages

CHARLES WHITE MILLENDER, Asheville, N. C., to Miss Dorothy Thompson Aiken of Columbia, Tenn., in Atlanta, Ga., June 7.

JOHN HAROLD SHANKLIN, Parkersburg, W. Va., to Miss Nancy Elizabeth Bedford of Osawatimic, Kan., July 5.

MARVIN DEEVER McCULLOUGH, Knoxville, Tenn., to Miss Margaret Elizabeth Lane of Lone Mountain, May 1.

JAMES HARVEY JOHNSTON JR., Spartanburg, S. C., to Miss Jane Chauvin Hochendel in Houma, June 14.

ALBERT EARL BARNHARDT, Kannapolis, N. C., to Miss Margaret Helen Martin of Shelby in May.

HENRY BOONE GRANT, Garysburg, N. C., to Miss Elizabeth Cheatham Applewhite of Halifax, May 20.

SETH A. BRUMM, Philadelphia, to Mrs. Carver Havemeyer of New York in Middleburg, Va., in May.

MARLER SLATE TUTTLE, Kannapolis, N. C., to Miss Miriam Thompson Goodrum of Davidson, June 18.

EUGENE FREDERICK KOSTER, East Orange, N. J., to Miss Mary Jane Miller of Cape May, May 31.

FRANKLIN JOHNSON MOORE, Chicago, to Miss Helen Curry Stevenson of Columbia, S. C., in June.

CHARLIE LOUIS SYKES, Pilot Mountain, N. C., to Miss Dora-belle Graves at Mount Airy in May.

CHARLES WATERS THOMPSON, Washington, D. C., to Miss Betty Nichols in New York in June.

JEROME BOSTICK HAMER, Charlotte, N. C., to Miss Frances Rice Hill of Roanoke, Va., May 17.

VERNON BOULTER BEAM, Baton Rouge, La., to Miss Malcolm Thompson at New Orleans, May 11.

EDWARD LOWRY SHULER, State Park, S. C., to Miss Alberta Stoll Prince of Charleston in May.

EDWARD R. ANNIS, Tallahassee, Fla., to Miss Betty Starck of Miami in Jacksonville, June 16.

JOSEPH SAMUEL HOLBROOK, Statesville, N. C., to Miss Nancy Wheeler Cox of Raleigh in May.

WILLIAM LAMAR BRYAN JR. to DR. MARGARET E. STRANGE, both of New Orleans, May 30.

ERNEST HENRY ASCHENBACH to Miss Clara Chaconas, both of Washington, D. C., June 19.

JAMES GORDON McMILLAN to Miss Willie Logan, both of Chattanooga, Tenn., in May.

CHARLES S. HERTZ, Allentown, Pa., to Miss Lillian Stokes at Charlotte, N. C., May 1.

GUSTAVE A. HAGSTROM to Miss Margaret Fulton Cameron, both of New York, June 7.

GEORGE WILLIS BASS, Minneapolis, to Mrs. Frank E. Hills of New Hampshire, May 18.

OTIS HUNTER JONES to Mrs. Nancy Hovis Nichols, both of Charlotte, N. C., May 3.

JAMES LOUDEN BORLAND to Miss Margaret Gaillard, both of Jacksonville, Fla., May 1.

FRED W. OGDEN, Boston, to Miss Clara May Buchanan of New Orleans, June 17.

JOHN W. OVITZ JR., Sycamore, Ill., to Miss Virginia Noyes of Evanston, June 7.

JOHN RALPH RICE to Miss Helen Norine Ward, both of Elkton, Ky., May 15.

McCHORD WILLIAMS to Miss Helen Louise Avery, both of Boston, May 17.

Deaths

Thomas Aloysius O'Brien ☉ Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1905; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; ophthalmic surgeon, St. Joseph's, Philadelphia General and Wills hospitals, Philadelphia, and the Fitzgerald-Mercy Hospital, Darby; aged 58; died June 21, at his summer home in Ship Bottom, N. J., of carcinoma of the right breast and fracture of a femur.

John Joseph Shaw ☉ Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1908; secretary of the state department of health; in 1940 received the Strittmatter award of the Philadelphia County Medical Society for his service as health officer; aged 57; died, June 24, in Harrisburg, Pa., of coronary occlusion.

George Loewenthal, Rhinebeck, N. Y.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1923; member of the Medical Society of the State of New York; on the staff of the Northern Dutchess Health Service Center; aged 41; died, June 23, of injuries received in an automobile accident.

Rastus Ransom Norris ☉ Crisfield, Md.; University of Maryland School of Medicine, Baltimore, 1904; served during the World War; formerly acting assistant surgeon, United States Public Health Service; aged 59; on the staff of the Edward W. McCready Memorial Hospital, where he died, June 9, of angina pectoris.

Howard Paul Benjamin, Omaha; John A. Creighton Medical College, Omaha, 1909; served with the British Army during the World War; aged 55; died, April 18, in the Veterans Administration Facility, Lincoln, of cirrhosis of the liver with portal obstruction and edema of the lungs.

Louis Edward Eslick, Rockwell City, Iowa; Eclectic Medical Institute, Cincinnati, 1894; member of the Iowa State Medical Society; served during the World War; past president of the Calhoun County Medical Society; formerly mayor; aged 72; died, May 28, of cerebral hemorrhage.

Duncan D. McArthur, Los Angeles; University of Southern California College of Medicine, Los Angeles, 1905; member of the California Medical Association; aged 66; died, May 30, in the Good Samaritan Hospital of coronary sclerosis and acute pulmonary edema.

Charles Vincent O'Brien, Brooklyn; Syracuse University College of Medicine, 1909; a staff physician at the Brooklyn College; aged 55; on the staffs of the Victory Memorial Hospital and St. Mary's Hospital, where he died, June 18, of cerebral hemorrhage.

Robert Goldsborough Owen ☉ Detroit; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1908; member of the American Society of Clinical Pathologists; served during the World War; aged 59; died, June 2, in the Harper Hospital.

Philip Gillett Cole ☉ New York; Columbia University College of Physicians and Surgeons, New York, 1910; served during the World War; director of the Tarrytown (N. Y.) Hospital; aged 57; died, June 30, of cerebral thrombosis.

Charles Fred Freytag, Los Angeles; Rush Medical College, Chicago, 1905; member of the California Medical Association; aged 59; died, June 12, of an incised wound of the throat, self inflicted with a razor blade.

Llewellyn George Petch, San Francisco; Cooper Medical College, San Francisco, 1904; served during the World War; on the staff of the United States Marine Hospital; aged 59; died, June 4, of cerebral hemorrhage.

George Paul Norton, Fitchburg, Mass.; Bellevue Hospital Medical College, New York, 1895; member of the Massachusetts Medical Society; aged 67; died, June 12, in the Burbank Hospital of intestinal obstruction.

Frank D. Crigler, Ludlow, Ky.; Medical College of Ohio, Cincinnati, 1884; aged 82; died, June 13, in the Good Samaritan Hospital, Cincinnati, of cholecystitis, postoperative peritonitis, arteriosclerosis and myocarditis.

Francis John Diamond, Ravenna, Mich.; Loyola University School of Medicine, Chicago, 1928; member of the Michigan State Medical Society; served during the World War; aged 42; died, June 21.

Gordon Ezra Woodruff, Louisville, Ky.; University of Louisville School of Medicine, 1937; captain in the British Army Medical Corps; aged 29; was killed recently near Accra, West Africa, while in action.

William Clark Tilden, Stanwood, Iowa; State University of Iowa College of Medicine, Iowa City, 1902; for many years member of the school board; aged 70; died, June 4, of cerebral hemorrhage.

John William Dixon ☉ Edgewood, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1897; fellow of the American College of Surgeons; aged 69; died, June 12.

Thomas Abraham Dean, Casper, Wyo.; Louisville (Ky.) Medical College, 1893; member of the Wyoming State Medical Society; aged 88; died in June in the Memorial Hospital.

David Thomson, Peterborough, Ont., Canada; Trinity Medical College, Toronto, 1894; L.R.C.S., L.R.C.P., Edinburgh, and L.R.F.P.S., Glasgow, 1895; aged 71; died, May 18.

Robert Thomas Poling, Columbus, Ohio; Ohio State University College of Medicine, Columbus, 1925; aged 41; resident, Franklin County Sanatorium, where he died, June 8.

George Frederick Zachritz, Faulkton, S. D.; St. Louis University School of Medicine, 1916; served during the World War; county health officer; aged 46; died, June 1.

Walter Herman Rietz ☉ Peoria, Ill.; Rush Medical College, Chicago, 1915; aged 51; died, June 5, in St. Francis Hospital of carcinoma of the rectum.

Charles Sanford Porter, Los Angeles; University of the City of New York Medical Department, New York, 1893; aged 79; died, April 21, of uremia.

Alfredo Russo, Providence, R. I.; Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1900; aged 69; died, April 4, of myocarditis.

John O. Mathews, Memphis, Tenn.; Kentucky School of Medicine, Louisville, 1886; aged 83; died, June 9, at Dallas, Texas, of pulmonary abscess.

Petros Gerardus Hendricus Vander Wyst ☉ Altoona, Kan.; Hering Medical College, Chicago, 1912; aged 64; died, May 29, of heart disease.

Melvin Collins, Oxford, Kan.; Rush Medical College, Chicago, 1891; member of the Kansas Medical Society; aged 80; died, June 9, in Newton.

Isaac Smith Putnam, Dillonvale, Ohio; Starling-Ohio Medical College, Columbus, 1911; served during the World War; aged 52; died, June 5.

Samuel Mazor ☉ Philadelphia; Medico-chirurgical College of Philadelphia, 1914; aged 50; died, April 28, in the Temple University Hospital.

James M. Holtz, Etna, Pa.; Columbus Medical College, 1880; aged 93; died, June 1, in Alliance, Ohio, of myocarditis and arteriosclerosis.

Aaron J. Fulton, Blaine, Maine; University of Vermont College of Medicine, Burlington, 1890; aged 90; died April 21, of arteriosclerosis.

William Everett Kernan, Boston; Harvard Medical School, Boston, 1896; aged 68; died, June 4, of arteriosclerosis and heart disease.

Shuler Hardin Etheredge ☉ Tampa, Fla.; Medical College of the State of South Carolina, Charleston, 1924; aged 41; died, June 10.

Douglas C. Ramsey, New Providence, N. J.; St. Louis Medical College, 1880; aged 81; died, May 22, of chronic myocarditis.

Charles Wesley House, Auburn, N. Y.; Eclectic Medical Institute, Cincinnati, 1886; aged 78; died, June 2, of cerebral hemorrhage.

George R. Frey, Milwaukee; Milwaukee Medical College, 1906; aged 72; died, June 29, of acute miliary tuberculosis and myocarditis.

Allen Monroe Ottman ☉ Rochester, N. Y.; Albany (N. Y.) Medical College, 1897; aged 66; died, June 20, of coronary thrombosis.

Thomas R. Mullen, Omaha; John A. Creighton Medical College, Omaha, 1896; aged 73; died, April 29, of Parkinson's disease.

Frank Elbert Tolle ☉ Overland Park, Kan.; University of Kansas School of Medicine, Kansas City, 1932; aged 33; died, May 3.

duced to show that there is no lack of vitamin A is responsible for the other factors that involve the characteristics as muddiness, greasiness are caused by many diseases not deficiency. It was contended, there-

Correspondence

AUSCULTATORY PERCUSSION AS A DIAGNOSTIC METHOD

To the Editor:—When auscultatory percussion is used as a routine it will be found to be accurate for locating the apex of the heart. It is also of advantage in examination of the lungs. The simplicity of the method and its ready adaptability plus its assured accuracy should warrant its wide usage, especially by the keen diagnostician.

To locate the apex of the heart the stethoscope is held on the manubrium sterni, and light percussion is made beginning at the midaxillary line in the fifth left interspace. A definite change in sound will be detected as soon as the percussion reaches the left border of the heart. After the border of the heart is ascertained in each interspace, the distance to the right and left of the midsternal line may be recorded in centimeters.

Auscultatory percussion is of advantage also in examining the upper part of the chest anteriorly and posteriorly to detect minor changes in the apexes. For examination of the clavicular and subclavicular areas the stethoscope is placed over the upper dorsal vertebrae and light percussion is made with the finger over the clavicles and subclavicular areas. For examination of the posterior portion of the chest the stethoscope is placed over the manubrium sterni and light percussion is made over the upper part of the back. The method has proved a valuable diagnostic aid, especially if one uses the disk stethoscope. The examiner stands on the right side of the patient when examining the anterior part of the chest and on the left side of the patient when examining the upper posterior areas of the chest if the examiner is right handed, or vice versa if left handed.

My attention was first drawn to this method of outlining the heart by Dr. Henry Suydam Satterlee while we were on service at the Willard Parker Hospital in 1914. Dr. Satterlee used a light percussion hammer made of a 10 inch length of glass tubing $\frac{3}{16}$ inch in diameter. The tubing is bent at right angles to form a hammer head 2 inches long. In the handle portion a centimeter scale 19 cm. long is introduced. The ends of the tube are sealed with sealing wax. The percussion end is partly covered with rubber tubing.

Percussion with the finger may, of course, be substituted for the glass percussion hammer. Friction with a toothpick, an applicator or a vibrating tuning fork may be used similarly.

C. T. SHARPE, M.D., New York.

MEDIASTINOCARDIAC REACTION AFTER IRRADIATION

To the Editor:—In THE JOURNAL, June 14, page 2648, Dr. Edward Rose and Dr. Charles C. Wolferth report an acute mediastinocardiac reaction following irradiation for hyperthyroidism and describe 3 such cases, 2 occurring in 1937 and 1 in 1940. We have just reviewed 58 cases of hyperthyroidism treated in our service at Bellevue Hospital during the past fifteen years and in no instance have we seen any complication such as mediastinocardiac reaction. These unusual reactions reported by Rose and Wolferth are interesting, but I do not believe that their interpretations warrant the statement that irradiation was the cause. Were this phenomenon a frequent occurrence, the profession should have heard about it sooner. It seems peculiar that cases occurring in 1937 should be reported only now. In my opinion other causative factors are responsible for the condition reported by these authors.

IRA I. KAPLAN, M.D., New York.

Director, Radiation Therapy, Bellevue Hospital.

PINWORM INFECTION IN A FAMILY

To the Editor:—Relative to my article entitled "Acute Appendicitis and Pinworm Infection Occurring Concomitantly in the Same Family" (THE JOURNAL, Sept. 21, 1940, p. 1009), I have obtained more information concerning this family during a visit to the Warren General Hospital in Warren, Pa.

The mother, listed as Mrs. T. in the article, was admitted to the Warren General Hospital on April 2, 1941 with the complaint of pain in the lower part of the abdomen, more particularly in the right lower quadrant. There was no associated diarrhea or vomiting. Because of persistence of pain, an appendectomy was performed on April 4, and a slightly injected appendix, with its tip bound down, was found and removed. When the appendix was opened, actively motile pinworms were found present.

The blood counts taken preoperatively showed 2 per cent eosinophils. The postoperative course was uneventful.

VICTOR MAYER, M.D., New York.

HAZARD OF DIESEL ENGINE OIL UNDER PRESSURE

To the Editor:—In THE JOURNAL, June 28, page 2848, is an article on the injury of a hand with subsequent loss of fingers due to jets of Diesel engine oil impinging on the skin at high pressure.

In 1935 Dr. John F. Roberts presented a thesis for the degree of doctor of medical science on infiltration of tissues with medicaments at high pressure. That is not the exact title of the thesis, but it gives the sense.

Some time earlier Mr. Arnold Sutermeister, a mechanical engineer in Brooklyn, had a man working for him whose hand was hit by a very fine jet from a defect in a copper pipe carrying Diesel oil at high pressure. There was no immediate pain, and no wound could be seen. The man wiped off the oil and went on with his work. The next day the hand pained and was lanced by a physician. I think it was the thumb. A small collection of oil was found beneath the periosteum next to the bone. This was evacuated and recovery was uneventful.

In the case reported there is the possibility that the oil might have been found and evacuated had an immediate incision been made. Unfortunately Dr. Roberts' thesis, which is rather long, has never been printed but is on deposit in our library.

Mr. Sutermeister tried directing a jet of water at 9,000 pounds per square inch on the palm of his own hand and could see no effect, but on looking at the back of the hand he saw a "water blister." He brought the matter to the attention of our department of surgery, and Dr. Roberts worked on it as a means of painlessly injecting local anesthetics. Later a more powerful and convenient device than the one he used was developed in an experimental form under my guidance, but when tested on a guinea pig it was found to be capable of doing serious damage to tissues. It is now in the hands of Dr. J. C. Fiala at Memorial Hospital. He was interested in the possibility of using it in the treatment of deep tumors.

The track of the liquid when seen under a microscope is definite but very small. Many sheets of paper can be penetrated and tin or lead foil can be penetrated and, by moving the jet, can be cut. Dr. Hughes's paper is timely, and I am glad that he has brought the matter to the attention of the profession.

HORATIO B. WILLIAMS, M.D.,
Columbia University,
New York.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 16-17, 1942. Council on Medical Education and Hospitals, Sec., Dr. William D. Cutter, 535 North Dearborn Street, Chicago.

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, July 26, page 313.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 16-18. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARKANSAS: * Medical. Little Rock, Nov. 6-7. Sec., Dr. D. L. Owens, Harrison. Eclectic. Little Rock, Nov. 6. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), San Francisco, Oct. 1. Written. Sacramento, Oct. 20-23. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

GEORGIA: Atlanta, Oct. 14-15. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IOAHO: Boise, Oct. 7. Dir., Bureau of Occupational License, Mr. Walter Curtis, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Oct. 14-16. Supt. of Registration, Mr. Lucien A. File, Department of Registration and Education, Springfield.

INDIANA: Indianapolis, June 16-18. Sec., Board of Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Topeka, Sept. 23-24. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

MARYLAND: Medical. Baltimore, Dec. 9-12. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. Homeopathic. Baltimore, Dec. 9-10. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: * Lansing, Oct. 15-17. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 203 Hollister Bldg., Lansing.

MINNESOTA: * Minneapolis, Oct. 21-23. Sec., Dr. J. F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSISSIPPI: Reciprocity. Jackson, December. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: Helena, Oct. 6-8. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEVADA: Reciprocity with oral examination, Aug. 4. Sec., Dr. Fred M. Anderson, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, Sept. 11-12. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, Oct. 21-22. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 13-14. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 15-18. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, State Education Department, 315 Education Bldg., Albany.

VERMONT: Burlington, Feb. 10-12. Sec., Board of Medical Registration, Dr. F. J. Lawliss, Richmond.

VIRGINIA: Richmond, Dec. 9-12. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WASHINGTON: * Seattle, July 21-23. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

WISCONSIN: * Madison, Jan. 13-15. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, Oct. 6-7. Sec., Dr. M. C. Keith, State Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, Sept. 16. Sec., Mr. Franklin E. Roach, Science Hall, University of Arizona, Tucson.

COLORADO: Denver, Sept. 10-11. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: Oct. 11. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, Oct. 20-21. Sec., Dr. George C. Rubland, 203 District Bldg., Washington.

FLORIDA: DeLand, Nov. 1. Sec., Professor J. F. Conn., John B. Stetson University, DeLand.

MINNESOTA: Minneapolis, Oct. 7-8. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: Lincoln, Oct. 7-8. Dir., Bureau of Examining Boards, Mrs. Jeannette Crawford, 1009 State Capitol Bldg., Lincoln.

OREGON: Portland, Nov. 1. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Aug. 20. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Aberdeen, Dec. 5-6. Sec., Dr. G. M. Evans, Yankton.

WISCONSIN: Madison, Sept. 20. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

Wyoming Endorsement Report

The State of Wyoming Board of Medical Examiners reports 5 physicians licensed to practice medicine by endorsement on February 3. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year of Grad.	Endorsement of
University of Arkansas School of Medicine.....	(1926)		Arkansas
University of Nebraska College of Medicine.....	(1924),		
(1935), (1936) Nebraska			
Vanderbilt University School of Medicine.....	(1934)		Tennessee

Tennessee March Report

The Tennessee State Board of Medical Examiners reports the written examination for medical licensure held at Memphis, March 26-27, 1941. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-six candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Tennessee College of Medicine.....	(1941)		80.6,
81, 84.2, 84.6, 85, 85.1, 85.6, 85.8, 86.6, 86.6, 86.7,			
87.2, 87.6, 87.6, 87.6, 87.7, 87.7, 87.7, 88.2, 88.8, 88.9,			
89.2, 91.2			
University of Wisconsin Medical School.....	(1928)		89.1
University of Toronto Faculty of Medicine.....	(1938)		87.2
McGill University Faculty of Medicine.....	(1940)		84.4

Rhode Island April Report

The Rhode Island Board of Examiners in Medicine reports the written examination for medical licensure held at Providence, April 3-4, 1941. The examination covered 8 subjects and included 50 questions. An average of 80 per cent was required to pass. Four candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Boston University School of Medicine.....	(1939)		86.6
Harvard Medical School.....	(1938)		80
Tufts College Medical School.....	(1940)		84.1
Jefferson Medical College of Philadelphia.....	(1939)		86.6

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Acts: Failure of Board in Revocation Proceedings to Grant Bill of Particulars.—In revocation proceedings instituted by the Arizona State Dental Board Davis, a licensed dentist, was charged with employing a named unlicensed person to make dentures, an act that under the Arizona dental practice act can be performed only by a person licensed to practice dentistry. Davis appeared at the hearing on May 28, 1938 and moved for a bill of particulars to inform him of the names of the persons for whom the unlicensed person had allegedly performed services and the particular work done on each person on which the board would rely to sustain the charges. The motion was denied and the hearing proceeded. Witnesses testified with respect to dental work which the named unlicensed person did on them and of the connection of the accused dentist with such work so far as they were aware. The hearing was then continued to June 11. At that time the witnesses who had testified previously were recalled and were fully cross examined by counsel for the dentist, and the unlicensed person testified and was cross examined. The dentist then presented such evidence as he desired, and three witnesses, including the dentist himself, testified on his behalf. Thereafter the board revoked his license, which action was affirmed by the superior court, Maricopa County, in an action of certiorari subsequently brought by the dentist. The dentist then appealed to the Supreme Court of Arizona.

The principal point relied on by Davis on appeal was the failure of the board to grant him a bill of particulars. Had the hearing, said the Supreme Court, been concluded on May 28 without giving the dentist an opportunity to know before the hearing the names of the witnesses on whom the work by his unlicensed employee was alleged to have been done and the character of the work done on them, and the order of revocation made at that time, we believe that it would have been fatal to the jurisdiction of the board. Quasijudicial bodies, such as the state dental board, are not bound by all the methods of procedure used in the more formal trials provided for in court, and proceedings before them are not criminal and do not require that every doubt be resolved in favor of the innocence of the

licentiate. Nevertheless the fundamental principles of law and equity do apply to such proceedings and the accused must have knowledge of the charges made against him and a reasonable opportunity to meet them. A violation of this requirement goes to the jurisdiction of the body to act at all. To compel the dentist to go to trial without knowing, at such a time and in such a manner that he could properly prepare to refute their testimony, the names of the witnesses to be used against him and what violation of the dental act they would testify he had committed would have deprived him of a fundamental right. It was not necessary, however, that he should have been apprised of these facts at any particular time and in any particular manner, so long as he had a proper opportunity to make a defense. The record shows that the witnesses against him testified on May 28 and on that day he had full knowledge not only of what he was entitled to know, to wit, who they were and what the substance of their testimony would be, but what it actually was, and he was then given until June 11 to prepare his defense. Under these circumstances he had ample opportunity to meet their testimony and the failure to grant a bill of particulars when demanded did not go to the jurisdiction of the board.

The dentist contended further that the evidence before the board was insufficient to sustain the charges preferred against him. In a certiorari proceeding, said the Supreme Court, neither this court nor the trial court passes on the weight of the evidence. It is sufficient if there is testimony before the board that, if believed by a reasonable man, would show the jurisdiction of the board to act. The evidence before the board was ample in both quantity and quality, if believed by the board, to have justified it in finding that the dentist had violated the dental practice act, as charged, not once but repeatedly and continuously.

The dentist contended finally that the penalty of revocation was so severe that the Supreme Court might modify it. The dental practice act, said the Supreme Court, is explicit as to the only penalty which may be inflicted for a violation of it, namely the revocation of a license to practice dentistry. While the penalty is severe, it is not beyond the power of the legislature to inflict, and this court may not substitute its judgment for that of the legislature on this point.

The court accordingly affirmed the order of the board revoking Davis's license to practice.—*Davis v. Arizona State Dental Board*, 112 P. (2d) 877 (Ariz., 1941).

Medical Lien Act (Washington): Lien Applies Only with Respect to Services Rendered After Effective Date of Act.—Evelyn Maricelli was injured on Aug. 30, 1936 in an automobile accident occasioned by the negligence of the driver of the car in which she was riding. She was taken to a hospital conducted by the Columbia Clinic, Inc., and remained there, receiving treatment and care from physicians and other employees of the clinic, until Feb. 23, 1937. She executed a release and effected a settlement with the driver's insurer for \$4,000 and court costs on Feb. 18, 1938, on which day the insurer delivered to her a draft for that sum payable jointly to her and to the clinic. The clinic refused to endorse the draft until it had been paid approximately \$1,500, which it claimed for the hospital and medical services it had rendered and for the payment of which on the following day it for the first time filed a claim of lien by virtue of the Washington medical lien act (Laws, 1937, ch. 69). That act was enacted March 13, 1937, which was subsequent in time to the completion of all the services rendered by the clinic except two roentgenograms, which were taken in October and November 1937. Section 1 of the lien act, under which the clinic's claim of lien was asserted, provides in part, as follows:

Every operator of a hospital and every duly licensed nurse, practitioner, physician and surgeon rendering service for any person who has received a traumatic injury shall have a lien upon any claim, right of action and/or money to which such person is entitled against any tortfeasor and/or insurer of such tortfeasor for the value of such service, together with costs and such reasonable attorney's fees as the court may allow, incurred in enforcing such lien: Provided, further, That all the said liens for service rendered to any one person as a result of any one accident shall not exceed twenty-five (25) per centum of the amount of an award, verdict, report, decision, decree, judgment or settlement.

Miss Maricelli returned the draft to the insurer the day that the clinic refused to endorse it and demanded that she alone be paid in full in accordance with the terms of the settlement. The insurer, however, the following day, but before the clinic had filed its claim of lien, paid her \$3,000 and court costs and retained one quarter of the settlement to protect itself against the possibility that the clinic would successfully assert a lien on one quarter of the settlement. Later Miss Maricelli assigned to her mother, the plaintiff in the present proceedings, her claim to the \$1,000 retained by the insurer, and the plaintiff instituted an action against the insurer, to which the clinic and the driver were subsequently joined as parties. The insurer paid the \$1,000 into the registry of the court and was dismissed from the action. The cause then proceeded against the clinic alone, and the trial court ordered that the money deposited with it be paid to the clinic. The plaintiff then appealed to the Supreme Court of Washington.

Section 2 of the lien act provides as follows:

No person shall be entitled to the lien given by the preceding section unless he shall, within twenty (20) days after the date of such injury, or, if settlement has not been affected with and payment made to such injured person, then at any time before such settlement and payment, file for record with the county auditor of the county in which said service was performed, a notice of claim stating [certain prescribed details].

The plaintiff contended first that the clinic had not timely asserted and filed its claim for lien. This contention was based on the argument that the release executed by Miss Maricelli on Feb. 18, 1938 and the acceptance by her at that time of the original draft constituted a settlement and payment which occurred before the clinic had filed on February 19 its claim of lien as required by statute. The court, however, did not agree with the contention. In the first place, said the court, the section of the statute quoted immediately above requires only that the notice of claim for lien be filed prior to the time that settlement is effected with, and payment made to, the injured person. Although the original draft was delivered to Miss Maricelli personally, it was not in settlement and payment of her claim alone but for that of the clinic as well, because the draft was made payable to the two parties jointly. The full amount of the draft was neither intended for, nor received by, her alone. The very theory of the plaintiff's action throughout has been that Miss Maricelli has not been paid the full amount of the settlement. Hence, so far at least as she had not received payment, the time for filing a lien had not expired. In the second place, if the original draft is considered as settlement with, and payment to, Miss Maricelli alone, she repudiated it by returning the draft, demanding and accepting another and agreeing to the conditions under which the second draft was issued. At that time, moreover, the clinic's claim for lien had not been filed. In the third place, so far as the \$1,000 here involved is concerned, there had never been complete settlement and payment even as to Miss Maricelli. On the contrary, a portion of the total amount agreed on as a settlement was specifically withheld to await the judgment of the court in this action. Since the lien was filed prior to payment of the amount here in question to the injured person as contemplated by the statute, the filing was timely.

The plaintiff next contended, in effect, that the clinic actually had no lien, since the lien act cannot be construed retroactively and hence the lien provided therein applies only with respect to services rendered subsequent to the enactment of the act. The primary end in construing a statute, said the court, is to ascertain and effectuate, if possible, the legislative intent. To ascertain that intent resort must first be had to the context of the statute in question and to its subject matter, and when from the language of a statute the legislative intent is clearly apparent it must prevail. However, resort to the context and language of the statute here involved does not disclose any express statement or language from which it can be deduced whether or not the lien was intended to apply to services rendered prior to the passage of the act, for on that specific question the statute is silent and inscrutable. The court then determined the question in the light of another rule of statutory construction to the effect that retroactive legislation is looked on with disfavor and that statutes will be construed to be effective in futuro only unless the contrary intent clearly appears. The court

therefore concluded that the lien act does not operate retroactively and held that the clinic had no lien on the proceeds of the settlement for services rendered prior to the passage of the medical lien act.

In resisting the application of the rule of statutory construction against giving retroactive effect to a statute, unless the legislative intent to do so is clearly apparent, the clinic contended that the medical lien act is remedial in its nature and for that reason the rule of statutory construction just stated does not apply. It may be conceded, answered the court, that the lien act is remedial in its nature in the sense that it affords an additional remedy for the collection of a debt. However, the medical lien act is in derogation of the common law and therefore it is to be strictly construed and its operation will not be extended for the benefit of any persons who do not clearly come within its terms. Although the statute was enacted for the protection of hospitals, nurses and physicians generally it does not say, nor does it intimate, that those who perform services prior to its enactment were nevertheless entitled to its protection.

The court pointed out, however, that some of the services rendered by the clinic were performed after the statute became effective. Two roentgenograms were taken in October and November 1937, subsequent to the effective date of the lien act. These services, the court held, were wholly segregable from the services rendered at the hospital prior to the passage of the act, and the court could see no reason why the statute should not be held applicable to the latter portion of the services rendered. Accordingly, the court reversed the judgment awarding the entire \$1,000 to the clinic and directed the trial court to determine the value of the roentgenograms referred to and to enter a judgment in favor of the clinic to the extent of their value.—*Layton v. Home Indemnity Co.*, 113 P. (2d) 538 (Wash., 1941).

Federal Food, Drug, and Cosmetic Act: "Electreat Mechanical Heart" Misbranded.—The United States of America filed a libel in the district court, W. D. Missouri, W. D., for the destruction of six devices referred to as "Electreat Mechanical Hearts," which were seized by the government after moving in interstate commerce. The devices, the government claimed, were misbranded within the meaning of the Federal Food, Drug, and Cosmetic Act because of misleading labeling. The basis of this claim were statements made in a booklet that accompanied each seized device, that the device

will relieve pain, strengthen weak eyes, soothe sore eyes, improve the hearing, cure earache, moisten dry noses or dry running noses, thicken thin lips, relieve toothache, strengthen the voice, relieve sore throat, build up weak lungs, relieve pleurisy, strengthen the kidneys, cure lumbago, relieve constipation, soothe the piles, is good for neuritis, subtracts pain from burns, relaxes the muscles in a stiff thumb and soothes the pain in a mashed finger, retards or accelerates the development of a boil, heals broken noses, relaxes muscle cramps, is good for varicose veins and will warm cold feet or stop the foot from perspiring.

Each booklet gave specific directions concerning the use of the device to effect the ends just stated. The device itself, as described by the court,

consists of a cylindrical metal container having much the appearance of an ordinary flashlight, approximately ten-eleven inches long, an inch and a half in diameter with two small flashlight batteries in one end and in the other two coils. The primary coil is wound upon a soft iron core. The secondary coil is so wound that it may be moved longitudinally over the primary coil by means of a button attached to it and extending through the metal cylinder much as the switch on an ordinary flashlight is arranged. A common vibrator such as might be used on the old-fashioned doorbell, makes and breaks the current from the battery and transforms the galvanic current from the battery into the faradic or alternating current which is delivered to the body through a projection on one end of the instrument. The strength of the charge delivered to the body from the instrument is increased or decreased by means of sliding the secondary coil further over or away from the primary coil.

The manufacturer intervened in the cause and attempted to justify the numerous claims made for the device on the theory that "the instrument produces a faradic electrical current with the alternating impulses occurring at the rate of from 140 to 180 times a second which would cause the muscles and muscular tissue of the human body to contract and relax with beneficial results."

In this case, said the district court, the good faith of the manufacturer is not in issue. Nor is the inherent danger of the device or lack of it of any consequence. The issue is simply whether the claims made for the device are false or misleading. Convincing testimony, said the court, was offered by the government to demonstrate that even the principle sought to be followed by the manufacturer could not be applied with this instrument. It was pointed out that the speed or rapidity at which muscular tissue could contract and relax was much less than the rate at which the vibrations occurred in this instrument and the alternating impulses were given, and hence the only effect from the use of the instrument on the muscles of the body would be to cause them to contract and remain so until the instrument was removed, the batteries wore out or the muscles relaxed from fatigue. The extent of the accuracy of the actual claims made for the device and the literature accompanying it may be summarized much as one of the medical witnesses expressed it, when, in describing a diagram of the human anatomy with accompanying descriptive matter which appeared in one of the exhibits produced at the trial, he stated that there was an element of truth in the diagram, the element of truth being that the head was on the right end of the picture and the "rump" appeared in the proper position. From a practical standpoint, continued the court, the benefit to be derived from the use of the device was such as was stated by another witness that the use of the instrument would not injure a person if there was nothing the matter with him but that if he was suffering from any disorder or ailment its use might and probably would be injurious.

The court concluded that the claims made for the devices in the literature accompanying them were as falsely misleading as might well be possible by the use of the English language and that since the devices had moved in interstate commerce the provisions of the Federal Food, Drug, and Cosmetic Act applied. The court deemed it beyond the issues of the case to determine whether or not the manufacturer acted in good faith and honest belief that the devices would do the things claimed for them, and the court accordingly ordered the destruction of the devices.—*United States v. 6 Devices, "Electreat Mechanical Heart,"* 38 F. Supp. 236 (1941).

Society Proceedings

COMING MEETINGS

- American Association for the Study of Neoplastic Diseases, Washington, D. C., Sept. 4-6. Dr. Eugene R. Whitmore, 2139 Wyoming Ave. N.W., Washington, D. C., Secretary.
- American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Hot Springs, Va., Sept. 11-13. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.
- American Association of Railway Surgeons, Chicago, Sept. 8-10. Dr. Daniel B. Moss, 547 West Jackson Blvd., Chicago, Secretary.
- American Congress of Physical Therapy, Washington, D. C., Sept. 1-5. Dr. Richard Kovacs, 2 East 88th St., New York, Secretary.
- American Hospital Association, Atlantic City, N. J., Sept. 15-19. Dr. Bert W. Caldwell, 18 East Division St., Chicago, Executive Secretary.
- American Roentgen Ray Society, Cincinnati, Sept. 23-26. Dr. Carleton B. Peirce, Royal Victoria Hospital, Montreal, Canada, Secretary.
- Colorado State Medical Society, Estes Park, Sept. 17-20. Mr. Harvey T. Sethman, 537 Republic Bldg., Denver, Executive Secretary.
- Indiana State Medical Association, Indianapolis, Sept. 23-25. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.
- Michigan State Medical Society, Grand Rapids, Sept. 16-18. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing, Secretary.
- National Medical Association, Chicago, Aug. 18-22. Dr. John T. Givens, 1103 Church St., Norfolk, Va., General Secretary.
- Nevada State Medical Association, Elko, Sept. 26-27. Dr. Horace J. Brown, P. O. Box 698, Reno, Secretary.
- Northern Minnesota Medical Association, St. Cloud, Aug. 15-16. Dr. Clarence Jacobson, Chisholm, Secretary.
- Oregon State Medical Society, Portland, Sept. 3-6. Dr. M. L. Bridgeman, 1020 S. W. Taylor St., Portland, Secretary.
- Rocky Mountain Medical Conference, Yellowstone Park, Wyo., Sept. 2-4. Mr. W. H. Tibbals, 610 McIntyre Bldg., Salt Lake City, Secretary.
- Washington State Medical Association, Seattle, Aug. 24-26. Dr. Vernon W. Spickard, 1305 Fourth Ave., Seattle, Secretary.
- Wisconsin State Medical Society of Madison, Sept. 10-12. Mr. G. B. Larson, 110 East Main St., Madison, Assistant Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases, Huntington, Ind.

8:149-196 (May) 1941

- Roentgenologic Diagnosis of Tumors of Small Bowel. H. P. Doub and H. C. Jones, Detroit.—p. 149.
- Basal Secretion of Pavlov Pouch Dogs as Influenced by Oxygen Want. E. J. Van Liere and P. E. Vaughan, Morgantown, W. Va.—p. 155.
- Nutrition and Defense. Agnes Fay Morgan, Berkeley, Calif.—p. 156.
- Effect of Aluminum Hydroxide on Acid-Base Balance and Renal Function. J. B. Kirsner, Chicago.—p. 160.
- Influence of Certain Fruit Juices on Gastric Function. H. W. Haggard and L. A. Greenberg, New Haven, Conn.—p. 163.
- Secretion of Chlorine Ions in Achlorhydric Gastric Juice: Observations by Means of Radioactive Chlorine. A. Brunshwig, R. L. Schmitz and L. Slottin, Chicago.—p. 171.
- Studies on Chologogue and Choleretic Effects of Bile Acids as Compared with Oleic Acid. E. W. Lipschutz and I. A. Feder, Brooklyn.—p. 173.
- Influence of Phenolphthalein on Liver. B. Fantus, F. Steigmann and J. M. Dyniewicz, Chicago.—p. 176.
- Indications for Gastric Resection. F. H. Lahey, Boston.—p. 180.
- Atypical Regional Ileitis: Roentgenologic Limitations. A. M. Yunich, Albany, N. Y., and B. B. Crohn, New York.—p. 185.

American J. Obstetrics and Gynecology, St. Louis

41:547-732 (April) 1941. Partial Index

- Continuation Study: Postgraduate Education: Experiment. J. C. Litzenberg, Minneapolis.—p. 547.
- Inhibition of Lactation. H. L. Stewart Jr. and J. P. Pratt, Detroit.—p. 555.
- *Blood Prothrombin Levels in Newborn. C. P. Huber and J. C. Shrader, Indianapolis.—p. 566.
- Pituitary Extract for Dystocia Due to Uterine Inertia in First Stage of Labor. R. S. Siddall, and D. G. Harrel, Detroit.—p. 589.
- Relative Effect of Analgesia and Anesthesia in Production of Asphyxia Neonatorum. H. Henderson, E. B. Foster and L. S. Eno, Detroit.—p. 596.
- Conglutinatio Orificii Externi as Factor in Delayed Labor. P. J. Carter, New Orleans.—p. 606.
- Study of 107 Cases of Uterine Bleeding with Endometrial Biopsies. G. F. Douglas, Birmingham, Ala.—p. 624.
- *Therapeutic Value of Tubal Patency Tests in Sterility and Infertility. M. L. Leventhal and E. M. Solomon, Chicago.—p. 628.
- Occurrence of Diphtheria Antitoxin in Human Pregnant Mother, Newborn Infant and Placenta. J. Liebling, G. P. Youmans and H. E. Schmitz, Chicago.—p. 641.
- Cancer of Cervix Following Supravaginal Hysterectomy. G. G. Ward, New York.—p. 660.
- Some Clinical Observations on Endocrinology of Abortion. E. C. Hamblen, Durham, N. C.—p. 664.
- Clinical Study of Progesterone Therapy by Pellet Implantation. D. R. Mishell, Newark, N. J.—p. 687.
- Incidence of Endometrial Hyperplasia with Uterine Fibroids and External and Internal Endometriosis (Adenomyosis). D. N. Henderson, Toronto, Canada.—p. 694.

Blood Prothrombin Levels in Newborn.—Huber and Shrader determined blood prothrombin levels of 506 infants. There were 15 stillborn infants and 9 infants who died during the neonatal period, giving a gross fetal mortality of 4.5 per cent. The mothers of 2 of the 9 infants received vitamin K subsequent to delivery, 4 were born of mothers who received vitamin K during labor and 3 were in the control group of 182 infants receiving no vitamin K. In 2 of these 9 infants a clinical diagnosis of cerebral hemorrhage was confirmed at necropsy; the mothers of both infants received vitamin K during labor. In the second infant a prothrombin determination following the initial evidence of cerebral irritation was 50 per cent of normal. This infant was given 2 mg. of menadione by gavage nine hours before death. Necropsy disclosed an intracranial hemorrhage as the cause of death. That a low prothrombin level in the blood of either of these infants was a factor in the intracranial hemorrhage is not justified, as in the

first case there was obvious trauma and in the second the clotting activity was not impaired significantly. The production of a normal clot is only one of the factors in the control of hemorrhage. The permeability and fragility of the capillaries also play an important part. It seems fair to assume that trauma will continue to be the predominant cause of intracranial hemorrhage in the newborn. However, in an infant subjected to some degree of injury a significant hemorrhage may fail to develop unless the prothrombin level is definitely decreased, and a mild hemorrhage may become severe with the physiologic decrease in prothrombin from forty-eight to seventy-two hours subsequent to delivery. Therefore the administration of vitamin K during the early neonatal period or during labor should afford some increased protection. From a study of their data (182 infants given no vitamin K, 200 given menadione after delivery and the mothers of 117 infants given menadione during labor) the authors state that the preparation is remarkably prophylactic by either plan of administration. With some dosage adjustment and the time of its administration, complete prevention in a decrease of prothrombin may be anticipated. The data suggest that its administration more than two hours before delivery will prevent a significant decrease in more than 95 per cent of infants during the neonatal period and that all infants whose mothers have not received vitamin K more than two hours before delivery should receive 1 mg. of menadione six and twenty-four hours following delivery. All infants subjected to a prolonged or difficult delivery should be given a vitamin K preparation during the early neonatal period. The authors did not encounter a typical case of hemorrhagic disease in the newborn, but they observed 7 infants in whom various hemorrhagic tendencies were manifest. The level of clotting activity of these infants was below 10 per cent of normal. The administration of 1 mg. of menadione caused a prompt increase in the clotting activity and a cessation of hemorrhagic tendencies. More menadione may be required as determined by the prothrombin level. This group of infants offers confirmatory evidence that hemorrhagic disease is due to a prothrombin deficiency. Infants who show a prolonged low level of clotting activity without evidence of hemorrhage should be considered subclinical subjects of hemorrhagic disease. Perhaps some other factor is necessary to precipitate the hemorrhage.

Tubal Patency Tests in Sterility.—Leventhal and Solomon investigated 285 patients complaining of sterility or infertility. Conception took place in 88, or 31 per cent, of the group. Not every patient had a tubal patency test performed. When an obvious cause was discovered at the initial examination it was treated first. Thus the eradication of chronic endocervicitis with erosion or eversion was frequently followed by conception. The tubal patency test was performed on 165 patients. With male deficiencies and definite glandular dyscrasias eliminated, there remain 133 women in whom tubal insufflation or oil instillation as a therapeutic measure could be evaluated. In 114, or 85.7 per cent, patency of one or both tubes to gas or oil was demonstrated, and 51, or 45 per cent, of the latter became pregnant. Of the 19 in whom patency could not be demonstrated only 3, or 15.8 per cent, became pregnant. Altogether 54, or 40.8 per cent, of the 133 patients conceived. The average duration of marriage in the successful group was three and eight-tenths years, as compared with five and two-tenths years in the unsuccessful group. Generally accepted criteria by which the responsibility of insufflation may be estimated include pregnancy within two months without other therapeutic measures; 28 patients met these requirements. Thus, 21.5 per cent of patients on whom the tubal patency test was performed became pregnant and the pregnancy could be attributed directly to the procedure. Of these 28 patients 14 conceived immediately after the test, that is without an ensuing menstruation; 23 conceived within one month of the test. The study of the relationship of the patency test to pregnancy and associated pathologic changes among the 133 women shows that of the 63 unsuccessful cases with positive patency 27, or 42.5 per cent, showed the presence of associated pathologic changes. Thus the factor of associated pathologic conditions is an important one in influencing the therapeutic effect of insufflation and oil instillation. Only 6, or 15.8 per cent, of the successful group had associated pathologic conditions. A

total of 42 per cent of all the patients in whom the tubes were patent to gas or to gas and oil became pregnant (37 of 87). A positive illustration of the therapeutic value of insufflation alone is demonstrated by 1 patient who conceived on two occasions immediately after the Huhner and patency tests three years apart. In 6 instances with the tubes patent to gas but not to oil, pregnancy occurred only once. Thirteen of 20 patients in whom patency to gas was not demonstrated and who later evidenced patency to iodized oil became gravid, whereas none of the 9 women whose tubes were nonpatent to gas and who had no follow-up with oil conceived. This observation may be interpreted as evidence for the superiority of oil instillation over insufflation in the cure of sterility. One patient had a previous febrile abortion; examination revealed a third degree retroversion. Patency to gas failed on two occasions. Two oil instillations done four months apart failed to show "spill" after forty-eight hours. After the second instillation, pregnancy occurred without an ensuing menstruation. Similar instances occurred twice.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill. 45:481-640 (April) 1941

- *Tuberculin Test and Roentgenogram in Early Tuberculous Lesion. T. L. Badger and M. Ritvo, Boston.—p. 481.
Tuberculosis of Mediastinum. C. S. Keefer, Boston.—p. 489.
Tuberculous Tracheobronchitis: Radiation Therapy. L. F. Davenport, Boston.—p. 494.
*Sarcoid Disease as Revealed in Chest Roentgenogram. D. S. King, Boston.—p. 505.
*Incidence of Bronchomycosis in the South. R. J. Reeves, Durham, N. C.—p. 513.
Left Ventricular Aneurysm: Report of Case. W. C. Huyler, New York.—p. 521.
Calcification of Choroid Plexus and Its Displacement by Expanding Intracranial Lesions. A. E. Child, Montreal, Canada.—p. 523.
Cancer of Stomach in the Young. G. McNeer, New York.—p. 537.
Differential Diagnosis of Intestinal Polyposis. J. Felsen, New York.—p. 551.
Roentgen Diagnosis of Cysticercus. A. I. Dombrovsky, Rostov on the Don, Soviet Union.—p. 558.
Partial Hypoplasia of Lower Jaw (Achoondroplasia Partialis). K. Goldhamer, Quincy, Ill.—p. 563.
Treatment of Carcinoma of Breast by Interstitial Irradiation. R. W. Teahan, Philadelphia.—p. 567.
Adenocarcinoma, Scirrhus Type, of Left Male Breast, with Generalized Bone Metastasis: Case Report. S. K. Livingston, Hines, Ill.—p. 589.
Roentgen Treatment of Lobar Pneumonia. E. B. Settle, Rock Port, Mo.—p. 591.
Experimental Studies with "Contact" Roentgen Rays: Time-Intensity Factor of "Tumor Dose" for Rat Sarcoma 39 in Situ. J. Gershon-Cohen, H. Shay and S. S. Fels, Philadelphia.—p. 600.
Dependence of Biologic Effect of Radiation on Intensity and Wave-length, as Measured by Delayed Lethal Action on Chick Embryos. D. E. Lea, Cambridge, England.—p. 605.
Production and Measurement of Soft Roentgen Rays for Biologic Experiments. D. E. Lea, Cambridge, England.—p. 614.

Tuberculin Test and Roentgenogram in Early Tuberculosis.—Badger and Ritvo state that a study of tuberculosis in nurses at the Boston City Hospital, carried on since 1932, showed that the morbidity is almost equally distributed between those who enter training tuberculin positive and those who enter tuberculin negative. All but a few of the nurses who enter training with a negative tuberculin test become positive during their three years of training. In the majority of these the usual benign primary infection develops in a region not demonstrable roentgenographically. In a few nurses small but definite roentgenographic lesions develop without clinical manifestations, while others progress to clinically active tuberculosis. Once an early tuberculous lesion is established by its persistence in the roentgenogram it must, if possible, be determined whether it is an old healed scar, a latent process potentially active in the future, an early destructive infiltration or a benign lesion which will heal spontaneously. It is the roentgenologist's responsibility to recognize these small tuberculous infiltrations. He must understand their latent potentialities and in cooperation with the internist interpret correctly their characteristics.

Sarcoid Disease as Revealed in Roentgenogram.—From the 142 cases of established sarcoid disease encountered in three hospitals since 1921, King selected for discussion 50 presenting characteristic shadows in chest roentgenograms. In 24 diagnosis was proved by biopsy of the skin or a node, in 11 there were sarcoid lesions of the eyes, skin, glands or bones, but no biopsy, and in 15 only the chest roentgenogram constituted the

evidence. Roentgenograms are considered characteristic when the process is confined entirely or mainly to hilar nodes, when it involves only the pulmonary fields giving an appearance indistinguishable from miliary tuberculosis, or when it involves the nodes and apparently radiates from them into the pulmonary fields. The roentgenogram of the chest is not a measure of the gravity of the disease; extensive pulmonary changes may clear without any respiratory symptoms and be accompanied by only slight evidence of a disseminated process; or there may be little involvement of the chest roentgenologically, but lesions in other organs may cause prolonged and serious disability. The disease is of a protean nature. Pulmonary lesions are only part of the whole picture of sarcoidosis; nevertheless they are important and one must try to discover what happens to them with the passage of time. A satisfactory follow-up was made of 37 cases. In 23 the lesions seen in the chest have cleared completely, or almost completely, in from seven weeks to three years, the average time being twenty-two months. In 3 the process is clearing but has not disappeared entirely after from one to three years. In 8 there is no change after from three months to four years. In 3 the process is spreading after seven months, eight months and four years, respectively. In the last of these after apparent clearing there was a relapse with marked roentgen involvement of the lungs but without a corresponding increase in symptoms. This is the author's only instance of relapse after apparent clearing. The process may again clear, but it is possible that it is now active pulmonary tuberculosis. He has observed only 2 cases of possible pulmonary fibrosis suggesting that sarcoid may be the underlying etiologic factor. Generally sarcoid lesions of the chest tend to clear, but the time required varies and may be long. These lesions must be differentiated from erythema nodosum and mycotic infection.

Bronchomycosis in the South.—Reeves reports 79 cases of bronchomycosis, of which 16 were due to blastomycosis, 10 to actinomycosis, 40 to moniliasis, 3 to sporotrichosis, 5 to aspergillosis, 2 to geotrichosis, 2 to coccidioid granuloma and 1 to torulosis. There were 47 males and 32 females. The age range was from 4 months to 66 years and the duration of symptoms from one month to fifteen years. Twenty-six of the patients are living. The roentgen appearance in the early stages resembles bronchitis or pneumonitis rather than tuberculosis, but as the fungi give rise to the formation of pus within the alveoli either a bronchiectasis or consolidating masses result within the pulmonary structure. The Monilia infection seemed to present the most consistent roentgen changes; in the early stages the lesions were diffuse with small nodules throughout the entire pulmonary field, and in the later stages the lungs presented a diffuse chronic interstitial fibrosis extending from the hilus throughout the lungs, with less involvement of the apexes. This can usually be differentiated from tuberculosis because the fibrosis is more of a network with heavy beading. About 60 per cent of the actinomycosis cases showed pulmonary and skeletal involvement. The pulmonary lesions are usually pneumonic with irregular areas of consolidation which often break down and suppurate, leaving large cavities. It often starts as a central pneumonic process and occasionally extends through the chest wall. The author's patient with such lesions has been well for nine years. The pulmonary lesions of blastomycosis vary from dense pneumonic masses to a miliary distribution. The roentgen appearance of aspergillosis was consolidation simulating pneumonia. Geotrichosis has no typical roentgen appearance. The lungs, when involved, resemble chronic tuberculosis with heavy studding along the bronchi; frequently cavitation occurs. Sporotrichosis seldom produces pulmonary lesions. In 1 patient there was a diffuse nodular infiltration, radiating out along the bronchi in both lungs. The lesions have been reported as being more often a dense gummatous mass with long mycelia invading the pulmonary structure. Torulosis has no typical roentgen appearance. The lesions are often compatible with tuberculosis except that cavitation is rare. Bronchomycosis should be considered one of the more common problems of differential diagnosis. The presence of fungi only in the sputum is not sufficient to establish a diagnosis. Many fungi in the sputum are not virulent or pathogenic. Fungi may be pathogenic but still not the cause of the disease in question.

As yet many institutions are not adequately equipped for the isolation of the fungi, entailing time and expense; only the presence or absence of tubercle bacilli is looked for. Bronchomycosis is not universally fatal; cure is sometimes possible.

American Review of Tuberculosis, New York

43:449-580 (April) 1941

- Tuberculosis in the Rat: I. Gross Organ Changes and Tuberculin Sensitivity in Rats Infected with Tubercle Bacilli. C. C. Wessels, Philadelphia.—p. 449.
- Id.: II. Fate of Tubercle Bacilli in Various Organs of Rat. C. C. Wessels, Philadelphia.—p. 459.
- Artificial Pneumothorax in Patients Over 40. S. Diamond and H. T. Ivey, Legion, Texas.—p. 475.
- Tuberculosis Case Finding: X-Ray Survey of 28,331 Trade Union Members in New York City, 1939. H. R. Edwards, Sally Preas, Jean Downes and A. Robins, New York.—p. 491.
- Diameters of Normal and Abnormal Bronchi: Statistical Study. J. Chapman, Sanatorium, Texas, and H. E. Smith, Austin, Texas.—p. 504.
- *Bronchiectasis: Morphologic Varieties of Bronchiectasis in Relation to History, Symptoms and Signs. J. Chapman, Sanatorium, Texas, and H. Hoskins, San Antonio, Texas.—p. 512.
- Classification of Chronic Bronchiectasis. J. Chapman and D. McCullough, Sanatorium, Texas.—p. 521.
- Comparison of Reactions to Different Tuberculins in Same Individuals. C. L. Savage, Richmond, Va.—p. 527.
- Tuberculin Tests with Old Tuberculin and Purified Protein Derivative: Comparative Study of Old Tuberculin and Purified Protein Derivative in Tuberculin Testing of Guinea Pigs in Routine Diagnostic Service. E. M. Medlar, K. T. Sasano, D. W. Caldwell and E. L. Needham, Mount McGregor, N. Y.—p. 534.
- *Gastric Lavage in Adults with Pulmonary Tuberculosis. W. H. Roper, Sanatorium, N. C., and W. H. Ordway, Mount McGregor, N. Y. p. 543.
- Psychologic Factors in Tuberculous Patients: Observations at Sunny-side Sanatorium, with Especial Reference to Personality. I. T. Shultz, Indianapolis.—p. 557.

Bronchiectasis.—Chapman and Hoskins analyze 116 cases of bronchiectasis with regard to relationship between etiology, symptoms and signs and the type of dilatation observed on roentgen study. There were 60 instances of cylindric, 26 of saccular, 24 of varicose, 4 of fusiform and 2 of bronchiolectatic dilatation. Study of the age and sex of the patients having the principal three types fails to show any marked differences. The ratio of women to men is 3 to 2, but this approximates the proportion of the two sexes as they are admitted to the sanatorium. Blood spitting is more common with saccular dilatation. Of all the patients, equally divided among the three types, 42 per cent brought up sputum for more than two years. About one half estimated the amount at 1 ounce (30 cc.) or less in twenty-four hours. About 40 per cent denied having had pneumonia. The incidence of pneumonia in saccular bronchiectasis was greater than in the cylindric type. Influenza was denied by 27 per cent. There was no significant difference in its incidence among the three types. Nasal disease was a complaint of 35 per cent. Its incidence was about the same in the three types. Physical signs in cylindric bronchiectasis were absent more often than in the other types. The only patients known to have asthma were in the cylindric group. The authors' figures for distribution of the disease differ from other reports in that there was a relatively higher incidence in the right lower lobe as compared with the left. This is unexpected in view of the fact that congenital bronchiectasis should involve the left lower lobe more commonly. It appears that distinction between cylindric and sacular bronchiectasis is based on sound statistical grounds. This is not the case with other morphologic types.

Gastric Lavage in Adults with Pulmonary Tuberculosis.—Roper and Ordway studied fasting gastric contents of 135 tuberculous patients. Bacilli were recovered from the sputum of only 34.8 per cent of the patients. The addition of gastric lavage almost doubled the proportion, the percentage being 63. This increase was due largely to positive guinea pig inoculations with gastric contents from patients with minimal and moderately advanced disease who were unable to expectorate, and to a slightly less degree to positive lavages from patients whose sputums were negative. Excluding 12 patients with no sputum or with negative sputum who were not submitted to gastric lavage because they refused it or left the sanatorium prematurely, positive recovery was actually increased to 69.1 per cent in the 123 cases in which all tests were given.

Of 78 tuberculous patients tested by the gastric lavage during the first month of residence at the sanatorium 43 had no expectoration, and smear examinations of several sputums from each of the remaining 35 had been repeatedly negative. Eleven of the 78 patients were subsequently found to be positive by guinea pig tests of the sputum, while 44 were positive by the gastric lavage alone. Thirty-six of these 44 were either not expectorating or were producing sputum which was consistently negative by microscopic examination and animal inoculation. Had lavage of the stomach been omitted, the diagnosis could not have been confirmed in 36, or almost one half, of the 78 patients. The test is of assistance not only in the diagnosis but also in the management of the tuberculous patient. After years of treatment the sputum may disappear or become negative, while the gastric contents still exhibit virulent tubercle bacilli. Diagnosis of tuberculosis on the basis of smear examinations is not dependable. A single negative gastric lavage does not exclude active tuberculosis, for the same variability occurs as with sputum; the tuberculous patient may contain many tubercle bacilli on one day and none on the following day, or many tubercle bacilli may be present in a morning specimen with none being raised in the afternoon of the same day.

Annals of Internal Medicine, Lancaster, Pa.

14:1741-1968 (April) 1941

- Some Aspects of Nature of Chemical Changes Occurring in Atherosclerosis. I. H. Page, Indianapolis.—p. 1741.
- Cholesterol Content of Renal Arteries and Thoracic Aorta in Relation to Hypertension and Vascular Pathology. M. Bruger and M. R. Chassin, New York.—p. 1756.
- Nature of Malignant Hypertension. H. A. Derow and M. D. Altschule, Boston.—p. 1768.
- *Hepatolenticular Degeneration (Wilson's Disease) Following Splenectomy: Interrelationship of Reticuloendothelial and Central Nervous System. A. M. Rabiner, H. Joachim and I. S. Freiman, Brooklyn.—p. 1781.
- Quantitative Serologic Test for Syphilis: Its Variability, Usefulness in Routine Diagnosis and Possible Significance: Study of 1,665 Cases. J. E. Moore and H. Eagle, Baltimore.—p. 1802.
- Causes of Secondary Fever in Sulfapyridine Treated Pneumonia. H. F. Dowling and T. J. Abernethy, Washington, D. C.—p. 1815.
- *Treatment of Pneumococcal Pneumonia with Sulfapyridine. W. L. Winters, P. S. Rhoads, W. W. Fox and R. Rosi, Chicago.—p. 1827.
- Acquired Hemolytic Icterus. W. M. Fowler, Iowa City.—p. 1838.
- Intravenous Streptococcus Vaccine Treatment of Chronic Rheumatoid Disease. M. Wetherby, Minneapolis.—p. 1849.
- *Metabolic Cranioopathy: Hyperostosis Frontalis Interna. P. T. Knies and H. E. Le Fever, Columbus, Ohio.—p. 1858.
- Role of Diabetes in Development of Degenerative Vascular Disease, with Special Reference to Incidence of Retinitis and Peripheral Neuritis. T. J. Dry and E. A. Hines Jr., Rochester, Minn.—p. 1893.

Hepatolenticular Degeneration Following Splenectomy.—Rabiner and his associates report 2 instances of a heretofore unrecorded sequel to splenectomy. Symptoms indicating hepatolenticular degeneration followed soon after a splenectomy performed for anemia and purpura associated with splenomegaly. The symptoms direct attention to a possible contraindication to a splenectomy. In the first case mild parkinsonian tremors of four years' duration followed a febrile illness diagnosed as typhoid. The tremors were most likely due to striatal disease dating back to the febrile illness of four years before. This tremor was not associated with any gross disability. Following the splenectomy the tremor and the muscular rigidity were soon extreme, and the Kayser-Fleischer ring was noticed for the first time. The neurologic disorder then progressed rapidly. The splenectomy probably aggravated the striatal disease. The other patient had a chronic hemorrhagic diathesis for many years. Headaches, blurred vision and slowing up of activities suggested that the symptoms were due to epidemic encephalitis. However, none of the objective symptoms of disease of the basal ganglia were present until two months after the splenectomy, when the entire neurologic syndrome was initiated and progressed rapidly and resembled hepatolenticular disease. For a time the course remained stationary. Almost two years after the operation, in a fit of despondency, the first patient committed suicide. Necropsy revealed typical features of Wilson's disease. While the changes were diffuse, they were far more marked and advanced in the basal ganglia, thalamus and hypothalamus. A large number of type II glial cells of Alzheimer, typical of Wilson's disease and pseudosclerosis, were found in these areas. The authors feel that the case must be

placed in the category of hepatolenticular degeneration. While it does not fulfil the original pathologic criteria of Wilson, cystic degeneration of the putamen, nevertheless degeneration in this region, with formation of a spongy state, was prominent and the friability led them to believe that cystic degeneration might ultimately have ensued. The changes, while diffuse, did not follow the typical description of pseudosclerosis, which include diffuse and widely scattered Alzheimer cells. The authors supposed that they were dealing with a form of hepatolenticular degeneration intermediate between Wilson's disease and pseudosclerosis. It is apparent that removal of the spleen was not the primary etiologic factor responsible for the onset of hepatolenticular disease, as in each case the disease had existed preoperatively. This was shown by cirrhosis of the liver found at operation and by the preoperative existence of minimal neurologic symptoms the significance of which had been overlooked. It was present in a latent or subclinical form, and operation accelerated its process.

Sulfapyridine for Pneumococcic Pneumonia.—Winters and his colleagues from Jan. 15 to May 15, 1939 treated 123 pneumococcic pneumonia patients with sulfapyridine, and the mortality was 11.4 per cent. The mortality among 25 patients who received neither sulfapyridine nor antipneumococcus serum was 25 per cent. Study of the 123 treated patients shows that sulfapyridine was effective against all types of pneumococci encountered (eighteen types) and that its use was relatively safe. No deaths could be attributed to the treatment. Nausea and vomiting occurred frequently (35 per cent) but was serious in only 4 per cent and necessitated discontinuance of treatment. A study of the fatalities indicates that the most important prognostic factor was delay in treatment. Age, extent of pulmonary involvement, bacteremia and alcoholism were, in order of importance, further determining factors. Serum was not administered until it appeared obvious that sulfapyridine alone was inadequate, as indicated by continued fever, prostration, persistent bacteremia and spread of pneumonia. Toward the end of the study it was felt that serum should be given at once when the duration of the pneumonia was of four or more days, when more than one lobe was involved, when alcoholism was evident and when beginning septic complications, diabetes, heart disease or other diseases were present. When serum was used the initial dose was 200,000 or more units, and larger doses were given when more than one of the foregoing factors were present. Further serum treatment depended on the appearance of the patient and on the presence or absence of agglutinins in the patient's blood. The authors now feel that, whether any of the foregoing factors are present or not, patients whose admission blood culture is positive should be given serum unless the improvement to sulfapyridine between the drawing of the blood for the culture and the positive culture has been striking. While a few fatal cases are to be expected, the goal should be to lower this "irreducible minimum" to less than 5 per cent. This probably can be achieved through the persistent application of the foregoing principles of treatment.

Metabolic Craniopathy.—Knies and Le Fever review the literature on metabolic craniopathy for the past one hundred and seventy-three years, extend the concept of the malady and suggest additional factors. The disease has been linked with the pituitary gland and occasionally with ovarian menopausal changes because of the average age of the affected patients. However, 5 of the authors' patients were less than 20 years of age and 8 less than 30, making it apparent that the age of pathogenesis may long precede the menopause. Two cases have been reported under the age of 20 years. A similar doubt as to the menopausal effect is cast by the considerable number of cases of males reported in the literature. There were 5 males among the authors' series of 28. Three of their juvenile patients (2 male and 1 female) were siblings of a mother with well developed frontal hyperostosis, suggesting a familial and possibly a hereditary basis. Their cases are the first to give evidence of such a background. Sex preponderance is suggested by these instances. The usual discovery of the disease at later ages may depend on slowly progressive changes, beginning earlier with secondary changes which are detected

later. The discovery of well marked hyperostosis in traumatic cases without previous symptoms suggests a possible long latent period. The slight impairment of health in the earlier stages indicates that the majority of pathologic studies have been made late in senile patients and that the younger patients have been overlooked. The endocrine aspects of the disease appear unquestionable and are compatible with a hereditary concept of pathogenesis. The progress of the cranial changes of 2 patients, including not only the diploic changes but also those of frontal internal hyperostosis, has been observed by the authors for more than two years. Extracranial changes are rare. The association of trauma appears definite. It is probable that in some instances pituitary or adjacent changes induced by injury to the head have through secondary endocrine mechanisms ultimately caused hyperostosis and other features of metabolic craniopathy. In many other cases injury only brought to light previously latent, asymptomatic changes. The social implications of the disease are important; 3 instances of violent anti-social tendencies have been reported, including a patient with "revenge psychosis" and 2 murderers reported by the authors. Usually the psychoses are mild and tend to be intermittent. Thus the disease assumes further importance in considering the background of psychoses of uncertain etiology, as demonstrated by Moore. Treatment has been symptomatic or empiric and generally ineffective. In view of the pathogenesis, surgical removal of the hyperostoses, difficult because of the dense dural adhesions, would probably not be either feasible or effective. Furthermore the clinical features are not always dependent on the type or extent of the osseous changes and are often dissociated in terms of time. Future reports should include critical analyses of the treatment and detailed study of the familial background.

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Delaware State Medical Journal, Wilmington

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- *Conservative Treatment of Sciatic Pain in Low Back Disability. J. G. Kuhns, Boston.—p. 435.
- *Posterior Protrusion of Lumbar Intervertebral Disks. J. S. Barr and W. J. Mixer, Boston.—p. 444.
- *Low Backache and Sciatic Pain Associated with Spondylolisthesis and Protruded Intervertebral Disk: Incidence, Significance and Treatment. H. W. Meyerding, Rochester, Minn.—p. 461.
- Relief of Low Back Pain and Sciatica by Release of Fascia and Muscle. C. H. Heyman, Cleveland.—p. 474.
- Fascial Elements in Associated Low Back and Sciatic Pain. A. H. Freiberg, Cincinnati.—p. 478.
- Articular Facets in Relation to Low Back Pain and Sciatic Radiation. C. E. Badgley, Ann Arbor, Mich.—p. 481.

Treatment of Tendons in Compound Injuries of Hand.

—According to Bunnell, the outcome of compound injuries of the hand and the prevention of sloughing tendons, infected joints and osteomyelitis is determined by (1) early operation, (2) thorough débridement and (3) covering of all vulnerable tissues. It is preferable to suture tendons within six hours after the accident, but when all factors (infection, degree of trauma, condition of patient and management) are favorable primary suture of tendons can be successfully done after six hours, in a gradually decreasing number of cases, up to but never after twenty-four hours. Tendons should never be sutured if the wound is already infected, if more than twenty-four hours old or in the presence of too much crushed, damaged, dirt-ground or badly contaminated tissue. The operation should never be done with poor hospital facilities or by an unskilled surgeon. It is preferable to leave a severed tendon undisturbed, repairing it later under good conditions, than to repair it under adverse conditions and make the limb worse. When making incisions, one should take care to avoid crossing flexion creases at a right angle or injuring small nerves. Catgut is the least satisfactory suture material. Fine stainless steel wire number 34 or 35 provokes the least reaction of all suture materials. In the primary repair of tendons, the stitch should be the simplest possible. It must cross some fibers for a spliced effect, but this should be minimal. A core suture is less likely to cause adhesions than one on the surface of the tendon. The smooth glistening epitendon surrounding the tendon should not be even scratched. The suture material should be sunk into the tendon. There should be no slack. Some central necrosis will result from the tightness, but eventually it will be replaced by tendon cells. To prevent tendon ends from pulling apart more reliance should be placed on splinting, with joints flexed to relax the tendons, than on the strength of the suture. In three weeks physiologic union allows removal of the splint, a half circumference plaster of paris. At this time, after tendon union, the suture is withdrawn and irritation from it is obviated.

Treatment for Sciatic Pain Due to Low Back Disability.—Kuhns discusses the conservative treatment and the results in 1,000 cases of sciatic pain and low back disability encountered during the last ten years. Conservative treatment includes rest in special positions, support, medications and physical therapy but not manipulation or operative procedures. The low back pain of 519 patients had been present for two weeks or less and of 481 it was of longer duration. In most instances the lesion causing the low back pain is presumed to be a ligamentous tear or a separation of fibers at the musculotendinous junction. Pain and disability often disappear after immobilization and support with attempted relaxation of the injured part. The best method of securing immobilization and

ligamentous relaxation is to keep the patient constantly on a firm bed with the entire body horizontal except for slight flexion at the hip joint. This can be secured in the supine position by placing a pillow under the knees or, in the prone position, under the abdomen. If the ligamentous injury is severe it may be necessary to apply a plaster back shell or a plaster spica for immobilization. In most instances while the patient is in bed physical therapy, heat daily, should be given to the posterior surface of the spine and pelvis to improve local circulation, relax muscular spasm, relieve pain and hasten the absorption of inflammatory exudate. As soon as muscular spasm and pain begin to subside and the patient can move in the bed without much discomfort, exercises to teach him muscular coordination are begun. The average period of complete recumbence was ten days. It should be continued until pain and local tenderness subside. This is not the end of treatment, as usually a prolonged convalescence is required for the individual to be able to resume his usual activities. Because the time required to heal a ligamentous tear is long and an unguarded movement during convalescence may cause it to recur, a spinal support is advisable. For the author's patients an average of forty-eight days was required before the spinal symptoms and signs subsided and the patients returned to work. The extremities were one week and ten months. Some patients who return and continue at work are never wholly free of symptoms, although physical signs do not suggest a spinal lesion. The reasons for their continued symptoms may be a chronic arthritis, a congenital anomaly making the back potentially weak, working long hours with the back bent or the inability to learn to use the body in a more correct habitual position. Of the 1,000 patients treated conservatively for the relief of local and referred pain, the pain of 771 was relieved, that of 72 was not relieved and the result in 157 is not known. Of 449 patients with sciatic radiation of pain, 356, or 79 per cent, were relieved. The study suggests that all patients with acute traumatic and chronic postural strains of the low back can be expected to recover under conservative treatment. The length of treatment will depend on the severity of the trauma, the chronicity of the lesion and the cooperation of the patient. For those patients with structural changes in the vertebrae or their contiguous structures when structural restoration cannot be expected, as in metastatic malignant growths, conservative therapy may prolong function and is a definite palliative measure. If normal osseous contour is established, conservative therapy is necessary for the recovery of normal function. For the group of patients with low back pain from pressure or irritation within or about the spinal canal, conservative treatment may be of little benefit. If a definite lesion exists, its removal is indicated. The author had no patients with pain referred to the back from other parts of the body, usually the abdominal and pelvic viscera, but says that the lesion that causes the referred pain should be treated.

Posterior Protrusion of Intervertebral Disks.—Barr and Mixer find posterior protrusion of one of the lumbar intervertebral disks into the spinal canal to be the most common mechanical derangement of the low back in patients suffering from intractable sciatic pain. In addition, there may be associated thickening of the ligamentum flavum, chronic adhesive arachnoiditis, hypermobility of the involved vertebrae and edema of the involved nerve roots. Although the etiology of posterior disk protrusions is not clear, trauma to and/or degenerative changes in the intervertebral disks seem to be the usual causes. Conservative treatment should be tried in every suspected protrusion of the intervertebral disks unless there is obvious serious nerve root pressure shown by sensory or motor disturbance. Bed rest and immobilization of the lumbar spine in a plaster jacket are effective means. Surgical treatment removes the ruptured disk fragment through as small a laminectomy incision as possible. Spinal fusion at the time of the laminectomy seems to give definitely better results than laminectomy alone. Of 94 cases of proved ruptured intervertebral disk that the authors followed for at least one year after operation, 77 per cent were completely relieved of sciatic pain and in an additional 18 per cent only minor leg pain persisted. There were 2 proved cases of recurrent ruptures. The relief of back symptoms was not as satisfactory as the relief of radiating leg pain. Of the

patients in whom the spine was fused, 73 per cent and 52 per cent of those without fusion had no back symptoms. The rest had complaints of backache or weakness of varying severity. The end result of 20 proved cases, in which compensation was involved and the patients' medical expenses were paid by an insurance company, reveals that 9, or 45 per cent, have resumed their original occupation and consider themselves fully recovered, 6 others are at work at lighter jobs and 5 are still receiving compensation or have litigation pending and consider themselves disabled.

Low Backache and Sciatic Pain.—To determine the incidence of low back pain and sciatica among patients suffering from spondylolisthesis, Meyerding reviewed the histories of the 745 patients for whom such a diagnosis was made between 1918 and 1940. He found 80 patients, or 10.7 per cent, who were so afflicted. A much larger percentage of patients suffering from spondylolisthesis had vague referred pain and paresthesia of the buttocks, hips and thighs that were aggravated by activity. He believes that patients with spondylolisthesis are more likely to have a protruded intervertebral disk than are those with more stable spinal columns. Trauma was a definite factor in 43 of the 80 patients. In the author's opinion fusion of the lumbosacral region is desirable in those cases of spondylolisthesis with symptoms of protruded disk in which the surgeon is unable to demonstrate the disk at the time of the operation. This fixation will prevent movement and slipping and additional symptoms of backache and sciatic pain. Cooperation of the roentgenologist, neurologist and orthopedic surgeon has made it possible to diagnose the condition accurately and to relieve patients whose ailment has heretofore baffled the diagnostic efforts of even the most skilled surgeons.

Journal of Experimental Medicine, New York

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- Vasoligation and Vasotranssection Without Scrotal Incision. R. A. Way and W. L. White, Spartanburg, S. C.—p. 760.
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- Sulfathiazole and Staphylococcus in Urinary Infections. G. Carroll, L. Kappel and B. Lewis, St. Louis.—p. 770.
- Effect of Small Doses of Testosterone Propionate on Testis and Accessory Sex Organs. H. S. Rubinstein and A. A. Kurland, Baltimore.—p. 780.

Response of Cardiovascular System to Intravenous Fluids.—Murphy determined the effect of fluids on tests of cardiovascular function in 149 elderly individuals with and 10 without evidence of heart disease. The cardiovascular disturbances were arterial hypertension, valvular heart disease, coronary artery disease or hypertensive heart disease. The author's purpose was to test the tolerance of the cardiovascular system to added strain from increased blood volume and therefore he did not confine the use of fluids strictly to the standards of safe therapeutic control. Records were made of changes in the plasma and blood volume, erythrocyte counts, hematocrit determinations, the amount of plasma protein, hemoglobin, pulse rate, blood pressure, respiratory rate, venous pressure, blood circulation time, the vital capacity changes, the minute volume urinary output and in the electrocardiograms. The rate of administering the fluids varied from 10 to 30 cc. per minute. Clinical observations show that some patients with compensated heart lesions tolerate large quantities of fluid very well whereas others with similar lesions respond badly. The author knows of no test that will enable one to determine the response beforehand. In the presence of an organic defect, regardless of the compensation, small amounts of fluids should be given, preferably isotonic, and they should be given slowly. Patients with pneumonia or other serious pulmonary impairment tolerate large

quantities of fluid badly under all circumstances. The venous pressure is not always sufficiently elevated to be the sole cause of the hemoconcentration occurring in heart failure or the decreased plasma and blood volume changes observed in patients going into failure. Vital capacity likewise cannot be regarded as a test for determining beforehand how the cardiovascular system will respond to fluids, yet it is an important aid in estimating the presence or absence of pulmonary congestion. If the heart is impaired, the speed of giving fluids intravenously is the most important single factor. Most patients will tolerate fluids well if they are given slowly, from 5 to 10 cc. per minute. The ultimate fate and mode of distribution or loss of injected fluid is dependent on the nature of the solution, the state of hydration, the degree of cardiac compensation, the level of the venous pressure and the chemical changes in the blood and tissues that influence osmotic pressure. Patients without heart failure will tolerate fluids in amounts up to 3,000 cc. a day even when dehydration is absent. The main safeguard for guidance in intravenous fluid therapy is the condition of the cardiovascular system. Hematocrit, plasma protein, venous pressure and vital capacity determinations are of great importance in determining the kind and quantity of fluid to be given and the speed of injection, but they do not aid in eliciting the ability of the cardiovascular system to accommodate fluids.

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Nonbloody Vaginal Discharges of Pregnancy. W. F. Guerriero and R. E. Arnell, New Orleans.—p. 574.
Studies with Antigens: X. Statistical Methods for Analysis of Comparative Skin Reactions. M. R. Pabst, C. H. Boatner and B. G. Efron, New Orleans.—p. 579.
Bacangiosis: Fungus Disease of Lung: Case Report. S. C. Jamison and J. Hopkins, New Orleans.—p. 580.
Extramedullary Aneurysm of Spinal Cord. D. H. Echols and R. G. Holcombe Jr., New Orleans.—p. 582.

Public Health Reports, Washington, D. C.

56:751-814 (April 11) 1941

- Mobile Laboratory Units of the Ohio River Pollution Survey. F. E. DeMartini.—p. 754.
Domestic Water and Dental Caries: II. Study of 2,832 White Children, Aged 12-14 Years, of Eight Suburban Chicago Communities, Including *Lactobacillus Acidophilus* Studies of 1,761 Children. H. T. Dean, P. Jay, F. A. Arnold Jr. and E. Elvove.—p. 761.
Application of Human Serum Opacity Reaction for Evaluating Antitoxin Binding Power (LB) of *Clostridium Perfringens* (Type A) Toxoid. S. C. Seal and Sarah E. Stewart.—p. 792.
Disabling Morbidity Among Industrial Workers, Final Quarter of 1940, with Index of Previous Publications of This Series. W. M. Gafater.—p. 799.

56:871-928 (April 25) 1941

- Recent Developments Relating to Public Health Interest in Housing. J. C. Leukhart.—p. 871.
Prevalence of Poliomyelitis in the United States in 1940. C. C. Dauer.—p. 875.
Preliminary Survey of Anopheline Mosquito Fauna of Southeastern Minnesota and Adjacent Wisconsin Areas. R. H. Daggy, O. J. Muegge and W. A. Riley.—p. 883.
Postsanatorium Tuberculosis Survival Rates in Minnesota. H. E. Hilleboe.—p. 895.
Choriomeningitis Virus Infection Without Central Nervous System Manifestations: Report of Case. C. Armstrong and J. W. Hornbrook.—p. 907.
Further New Species of Ornithodoros from Bats (Acarina: Argasidae). R. A. Cooley and G. M. Kohls.—p. 910.

56:929-984 (May 2) 1941

- How Health Departments Function with Respect to Specific Problems. J. O. Dean and Evelyn Flook.—p. 929.
Bactericidal Effect of Paraffining of Paper Board Used for Paper Milk Containers. F. J. Moss, R. C. Thomas and Mildred K. Havens.—p. 944.
Dick Reaction and Scarlet Fever Morbidity Following Injections of Purified and Tannic Acid Precipitated Erythrogenic Toxin. M. V. Veldee, E. C. Peck, J. P. Franklin and H. R. DuPuy.—p. 957.

56:985-1038 (May 9) 1941

- Special Problems in Our Health Defenses. P. V. McNutt.—p. 988.
"Sporadic" Poliomyelitis, with Special Reference to Geographic and Chronologic Distribution in Tennessee in the Eighteen Months Ended June 30, 1940. L. L. Lumsden.—p. 992.
Clinical Study of Poliomyelitis in Charleston County, South Carolina, 1939. D. J. Davis, F. J. Weber and Margaret S. Arcy.—p. 1007.
Causes of Physical Disqualification Under the Selective Service Law: Early Indications. R. H. Britten and G. St. J. Perrott.—p. 1017.
Portable Unit for Determination of Halogenated Hydrocarbons. H. C. Dudley.—p. 1021.

Rocky Mountain Medical Journal, Denver

38:337-416 (May) 1941

- Metabolic Significance of Vitamins. A. H. Smith, Detroit.—p. 354.
Malunited and Ununited Fractures of Both Bones of Forearm. R. K. Ghormley, Rochester, Minn.—p. 358.
Prolonged Labor. E. L. King, New Orleans.—p. 363.
*Induced Anoxemia in Diagnosis of Coronary Artery Disease: Investigation as to Its Value. C. T. Burnett, M. G. Nims and C. J. Josephson, Denver.—p. 367.
Neurosyphilis: Its Industrial Implications. P. Work, Denver.—p. 371.
Utilization of Mental Faculties as Aid in Treatment of Disease. D. E. Johnson, Alamosa, Colo.—p. 375.
Expansion of Blue Cross Plan to Serve Additional Communities. W. S. McNary, Denver.—p. 380.

Induced Anoxemia in Coronary Disease.—Burnett and his colleagues studied the effects of induced anoxemia in 50 normal persons from 20 to 30 years of age. In general their observations have substantiated those reported by Levy. While the appearance of angina-like pain is important, the interruption of the test depends more on the electrocardiographic changes which may occur under conditions of induced anoxemia. The electrocardiogram of the normal individual subjected to this test undergoes slight changes in the RS-T intervals and T wave amplitude. According to Levy, in the presence of coronary insufficiency these RS-T changes become greatly exaggerated. Partial or complete reversal of T waves may occur with or without these RS-T deviations. These changes are promptly reversible by inhalation of pure oxygen. Their demonstration may prove to be of some value in the diagnosis of insufficiency of the coronary circulation. Carelessly applied, the test is hazardous, but under meticulous conditions it is not dangerous and when carried out by experienced workers is of diagnostic value.

Surgery, St. Louis

9:493-656 (April) 1941

- Comparative Results in Use of Living and Preserved Fascia as Suture Material in Bone. A. R. Koontz and R. T. Shackelford, Baltimore.—p. 493.
- Studies on Shock: III. Variability of Shock Syndrome in Toxic Drug Shock. F. Neuwelt, S. O. Levinson and H. Necheles, Chicago.—p. 503.
- *Staphylococci Septicemia: Treatment by Chemotherapy and Serotherapy. S. L. Goldberg and E. D. Bloomenthal, Chicago.—p. 508.
- Inefficacy of Lumbar Puncture for Removal of Red Blood Cells from Cerebrospinal Fluid. J. M. Meredith, University, Va.—p. 524.
- Absorption of Sulfanilamide from Burned Surfaces. D. H. Hooker and C. R. Lam, Detroit.—p. 534.
- Peptic Ulcer and Diarrhea Following Removal of Prevertebral Ganglions in Dogs: Antispasmodic Effects of Magnesium Sulfate, Pentobarbital and Atropine Sulfate. R. Liun, Portsmouth, N. H.—p. 538.
- *Large Islet Cell Tumor of Pancreas. A. Brunschwig, Chicago.—p. 554.
- Strangulated Hernia Reduced En Masse. D. Casten and M. Bodenheimer, New York.—p. 561.
- Acute Complete Obstruction of Hepatic Veins: Report of Case Simulating Acute Abdomen. A. M. Dickinson, Albany, N. Y.—p. 567.
- Syphilis of Stomach Necessitating Total Gastrectomy. C. H. Avent, Memphis, Tenn.—p. 571.
- *Epiloia: Report of Cases. L. M. Quill and Esther C. Marting, Cincinnati.—p. 581.
- System of Surgical Follow-Up and Record Keeping. C. E. Gardner Jr., Durham, N. C.—p. 591.
- *Successful Ligation of Patent Ductus Arteriosus. C. J. Miangolarra and E. Hull, New Orleans.—p. 597.

Staphylococci Septicemia.—Goldberg and Bloomenthal review instances of staphylococci septicemia treated at the Michael Reese Hospital from 1934 through 1939. The series includes 32 cases of staphylococemia, 19 males and 13 females, with 14 deaths. The diagnosis in each was established by recovery of the organism from the circulating blood stream in pure culture at least once. There were 26 instances of *Staphylococcus aureus* and 6 of *Staphylococcus albus*. In 23 patients the organism was also recovered from the primary or metastatic focus or both. The organisms entered the body through various ports, most frequently through the skin. The initial cutaneous lesion can be so small as to evade the most careful search. In 9 the initial focus was recovered as osteomyelitis; these may have been of such an origin. In 14 others the cutaneous focus was known; 11 carbuncles or furuncles, 1 infected bulla, 1 laceration and 1 infection secondary to trichophytosis of the feet. Infection of the upper part of the respiratory tract preceded the bacteremia of 6 patients, in 1 the origin was puerperal sepsis, in 1 infection of the urinary tract and in 1 a postoperative infection of a nasoplasty incision. The time between the appearance of the initial focus of infection and blood stream invasion varied from forty-eight hours to several weeks. Before the advent of sulfanilamide general treatment was mainly supportive and local treatment consisted of rest, heat, incision and drainage of collections of pus. Sulfanilamide alone was used for 6 patients, all of whom died. Six other patients were treated with sulfanilamide in combination with staphylococcus antitoxin, and 4 of these recovered. It did not appear that sulfanilamide had any specific value, as the clinical course of most of these patients was either moderately severe or protracted and recovery without the use of specific therapy was expected. Fifteen patients, 4 of whom were more than 14 years old, were treated with staphylococcus antitoxin alone or in combination with sulfanilamide or sulfapyridine. The total mortality rate was 33½ per cent. There were only 3 deaths among the 11 younger patients. The authors' experience, particularly in the more recent cases, in which larger doses of antitoxin (100,000 to 180,000 units) were administered, leads them to believe that antitoxin is of definite value and that it should be administered early and in sufficient dosage. The 6 patients admitted to the hospital during 1939 were treated with sulfapyridine. In 3 it was combined with staphylococcus antitoxin. All 6 patients recovered. The initial dose of the drug was approximately 1½ grains (0.1 Gm.) per pound of body weight for each twenty-four hours. The sulfapyridine blood level should be at least 6 mg. per hundred cubic centimeters, preferably between 6 and 9 mg. With the subsidence of symptoms, the dose should be reduced gradually. In all 6 patients, and especially the 3 patients also given staphylococcus antitoxin, the clinical improvement was definite and rapid and occurred soon after treatment was instituted. Sound surgical treatment of local

lesions is paramount. If the infection is in soft tissues, it should be treated conservatively and not manipulated until pus is formed. Heat and possibly roentgen irradiation are of value in localizing the infection. Collections of pus should be evacuated. Chemotherapy and serotherapy appear synergistic in action, and both agents should be used in staphylococci septicemia. Early clinical diagnosis and prompt institution of therapy before the diagnosis is corroborated by blood culture is important, as are supportive treatment and sound surgical measures.

Islet Cell Tumor of Pancreas.—Brunschwig reports a case of an islet cell tumor of the pancreas of unusual size. The tumor enlarged from about 7 cm. in diameter to 15 cm. in four months without gross evidence of metastases. This increase was not accompanied by a parallel increase in the number or severity of attacks, as judicious spacing of food intake controlled them fairly well. The patient's postoperative diabetes is accounted for on the basis of the relative inactivity of the remaining normal islet tissue as the result of the large output of insulin from the tumor and of the fact that, when the latter was suddenly withdrawn, the remaining normal pancreas could not cope with the sudden increased demands on it. Recovery of adequate function (insulin production) occurred after three weeks of injections of insulin. A study of the sections warrants the diagnosis of malignant neoplasm on morphologic criteria alone. However, from the biologic standpoint the absence of metastases while the primary tumor grew so rapidly in a relatively young adult (32 years of age) favors the view that the process was probably benign at operation or at least still localized. Previous experience has shown that, while microscopically these tumors might appear malignant, their removal has resulted in prolonged survival without recurrent attacks of hyperinsulinism. At the first exploration two tumors were observed. These apparently had fused and formed the large tumor removed at the second operation. While the smaller tumor might have been a local metastasis, it is equally probable that at the onset there were two distinct neoplasms arising from different islets.

Epiloia.—Quill and Marting describe the syndrome of epiloia observed in 7 persons of three generations. Although the mother of the first and seventh patients (the grandmother of the other 5 patients) was not examined clinically, the history of epileptic seizures, adenoma sebaceum and nailbed tumors makes the diagnosis of epiloia a valid presumption. If this is granted the study reveals direct passage of the disease through three generations. The study discloses that, if the epiloia patient lives through puberty and is capable of mating, transmission of the disease is possible. The reason for so few examples of transmission lies in the fact that the average affected patient is so mentally and physically incapacitated at puberty that marriage and mating do not occur. Study of the family tree discloses that 1 daughter (case 1) of the original epiloia patient transmitted the disease in all its intensity to all 4 of her children who lived to puberty; whereas, the other daughter (case 7) with signs of the disease apparently did not pass it on to her 2 older children. There is no evidence of the disease in the other 2 children of the original epiloia patient. Neither was it found in their children. This suggests that the disease is not recessive but rather incompletely dominant. The nailbed tumors, usually an uncommon accompaniment, are of particular interest because of their presence in all 7 cases. The presumption here is that epiloia is transmitted even in its minute details. The direct transmission of the disease from parent to offspring through three generations proves that the syndrome is hereditary, i. e. genotypical as suggested by Fabing.

Successful Ligation of Patent Ductus Arteriosus.—Miangolarra and Hull cite successful ligation of a patent ductus arteriosus in a 20 year old girl by the transpleural technic of Gross. They feel that all such operations should be recorded, in order that proper evaluation may be placed on the results of the procedure. Seven months after the operation the patient's status is approximately the same except that there is no evidence of patency of the duct. The patient may be spared the later development of heart failure, vegetative endarteritis or other complications of this anomaly.

Tennessee State Medical Assn. Journal, Nashville**34:83-120 (March) 1941**

- Pseudosinusitis. E. Orr, Nashville.—p. 83.
The Place of Vitamins in Therapy. J. B. Youmans, Nashville.—p. 88.
Treatment of Appendical Peritonitis. W. D. Haggard and J. A. Kirtley Jr., Nashville.—p. 97.

34:121-160 (April) 1941

- Seven Correctable Conditions Occasionally Labeled Idiopathic Epilepsy. T. F. Frist, Nashville.—p. 121.
Choice of Anesthesia in Acute Surgical Emergencies. H. M. Ausherman, Chattanooga.—p. 128.
Diagnosis and Management of Thyroid Disease. H. Wilson, Memphis.—p. 135.
The East Tennessee Medical Association. W. T. Mathes, Greeneville.—p. 138.
Management of Reactions to Arsenicals. C. Shaw, Chattanooga.—p. 142.

Texas State Journal of Medicine, Fort Worth**36:771-854 (April) 1941**

- Consideration of Some Common Pediatric Problems. A. Brown, Toronto.—p. 778.
*Tumors of Salivary Glands. A. O. Singleton and N. Duren, Galveston.—p. 784.
Uterine Endometriosis. T. A. Pressly, San Antonio.—p. 792.
Benign Lesions of Duodenum. R. T. Wilson, Austin.—p. 797.
Roentgenologic Diagnosis of Diseases of Stomach. L. M. Garrett, Corpus Christi.—p. 799.
*Ophthalmoplegic Migraine. R. K. Daily, Houston.—p. 802.
Public Health and the Practice of Medicine. W. C. Williams, Nashville, Tenn.—p. 806.

37:1-72 (May) 1941

- Technic and Value of Colposcopy. Clara K. Duncan, Houston.—p. 6.
Progress in Surgery of Large Bowel. G. W. Waldron, Houston.—p. 13.
"Cold Punch" Type of Prostatic Resection. J. H. Shane, Dallas.—p. 17.
Survey of the Present Status and Problems of Sterility. F. Cone, Houston.—p. 20.
Resection of Presacral Nerve for Dysmenorrhea and Pelvic Pain. J. W. Hendrick, Amarillo.—p. 26.
Construction of Artificial Vagina. J. A. Heymann, Wichita Falls.—p. 30.
Common Skin Diseases of Childhood. L. A. Brunsting, Rochester, Minn.—p. 33.
Regulation of Blood Sugar in Diabetes by Sublingual Administration of Insulin. D. R. Sacks, San Antonio.—p. 39.
Methods of Hemorrhage Control in Nose and Throat. K. Gill, Corpus Christi.—p. 43.
Bacon Saunders. K. H. Aynesworth, Waco.—p. 47.
Our Public Health Status. G. W. Cox, Austin.—p. 53.

Tumors of Salivary Glands.—Singleton and Duren report 55 tumors arising in the salivary glands and related tissues; 40 were mixed tumors and 15 carcinomas. The race, sex and site (side of the face) were approximately equal. The average age for the series was 38 years, for the mixed tumors 31.5 years and for the malignant tumors 52.3 years. The preoperative duration of the mixed tumors averaged five and four-tenths and that of the malignant tumors one and twenty-four one hundredths years. Recurrence data are available for 41 cases, 30 of which were mixed tumors and 10 recurred. Ten of the 15 malignant tumors were primarily excised at the John Sealy Hospital; 6 of the patients died from progression of the malignant process, and 3 of the 4 patients now alive have been free from recurrence for approximately one year. The fourth has been free from recurrence for four months. Regional metastases were present in 11 cases and general metastases in 1. The death of 9 patients was directly attributable to the tumor. The authors believe that, if the morbidity and deformity in addition to the mortality are considered, a more radical excision seems justified. They state that the tumors so treated tended to recur less often than those not so widely excised. In contrast to some authors' experience the smaller tumors, when excised, tended to recur less often than the larger ones.

Ophthalmoplegic Migraine.—Ophthalmoplegic migraine, according to Daily, describes a clinical syndrome characterized by attacks of severe headache and paralysis of the ocular muscles, with ptosis as a frequent symptom. A severe headache localized to one side develops in the course of the attack. It starts, as a rule, at the temple and spreads to the occipital and frontal regions. The headache is of the constant dull, harrowing type, as occurs in migraine and tumors of the brain. It is accompanied by nausea and vomiting but not by scintillating scotoma or any of the visual sensations common to migraine. Nausea accompanies the headache but may precede it or follow.

After from one day to a week of headache, paralysis of the oculomotor muscles sets in on the side of the pain. As the paralysis develops the headache and nausea abate, but there are cases in which this order is reversed. The duration of pain and paralysis and its extent and intensity are subject to wide variations in individuals and in attacks. It does not seem logical that a case of persistent paralysis and a case of transitory paralysis should be caused by the same pathologic process. Two types may be considered: the persistent paralysis, which must remain under the suspicion of an organic lesion, and transitory paralysis, which, the author suggests, might be considered as a vasomotor functional neurosis of the posterior cerebral artery. If the process is a transitory angiospasm the result is migraine with the various striking visual sensory phenomena. If the process is a vasodilatation with edema the result is a compression of the oculomotor nerves and paralysis. The intensity of the storm is obviously greater in ophthalmoplegic migraine; the shortest attack lasts much longer than the severest attack of ordinary migraine. What factor directs the vascular disturbance into a spasm or dilatation is not known. That psychic and emotional disturbances are important exciting factors has been established. The differential diagnosis has to eliminate intracranial tumors, aneurysm of the vessels at the base of the brain, congestion of the cavernous sinus, syphilis, tabes, syringomyelia, chronic meningitis, multiple neuritis, chronic ophthalmoplegia, chronic and subacute ophthalmoplegia combined with bulbar disease and disease of the anterior horn, asthenic ophthalmoplegia, multiple sclerosis and hysteria. Treatment is that of a functional neurosis and the prognosis is good. With a better understanding of the pathologic changes and therapy of functional neurosis, recurrent ophthalmoplegic migraine should be eliminated.

Virginia Medical Monthly, Richmond**68:247-312 (May) 1941**

- Peripheral Vascular Disease. D. G. Chapman, Richmond.—p. 247.
Fibroepithelial Tumors, Chronic Cystic Mastitis and Carcinoma of Breast. E. R. Whitmore, Washington, D. C.—p. 251.
Management of Thyroglossal Cyst: Report of Ten Cases. E. G. Gill, Roanoke.—p. 267.
Aneurysm of Abdominal Aorta: Report of Case of Rupture into Duodenum. H. M. Smith Jr., Philadelphia.—p. 270.
Sulfathiazole in Infections of Urinary Tract and in General Septicemia: Report of Fifty Cases. W. C. Stirling, Washington, D. C.—p. 274.
Lithopiedion of Seven Years' Duration Followed by Hydatiform Mole: Case Report. I. Tractenberg and W. Oliver, Brooklyn.—p. 277.
Sulfanilamide Therapy in Madura Foot. J. M. Dixon, Roanoke.—p. 281.
Habit. R. Blankinship, Richmond.—p. 282.
Four Problems Concerning Adenomatous Goiter. R. S. Anderson, Rocky Mount, N. C.—p. 285.
The Pediatrician's Role in Mental Hygiene. B. B. Jones, Richmond.—p. 286.

War Medicine, Chicago**1:301-462 (May) 1941**

- The Navy's Medical Department. W. J. C. Agnew and N. L. Saunders, Washington, D. C.—p. 301.
Plan for Collection, Transportation and Administration of Whole Blood and Plasma in Warfare. E. L. DeGowin and R. C. Hardin, Iowa City.—p. 326.
Effective Technic for Desiccating Plasma in Useful Quantities: Sterile Unit Desiccator. T. R. Folsom, New York.—p. 342.
What Physicians Expect from Psychiatry. E. C. Cutler, Boston.—p. 352.
Psychiatric Factors in the Medical Examination. J. H. Pratt, Boston.—p. 358.
Military Psychiatry and the Selective Service. W. C. Porter, Washington, D. C.—p. 364.
Economic Aspect of Psychiatric Examination of Registrants. M. Cooley, Washington, D. C.—p. 372.
Peculiar Personalities: Disorders of Mood; Psychopathic Personality. R. W. Hall, Washington, D. C.—p. 383.
Study of Specific Data in Lives of 183 Veterans Admitted to St. Elizabeths Hospital. A. Simon, Margaret Hagan and R. W. Hall, Washington, D. C.—p. 387.
Disorders with Structural Features. A. Simon, Washington, D. C.—p. 392.
Psychosomatic Disorders. A. Myerson, Boston.—p. 404.
Schizoid and Related Personalities. D. A. Thom, Boston.—p. 410.
Neuropsychiatric Examination of Applicants for Voluntary Enlistment and Selectees for Induction. Circular Letter No. 19.—p. 418.
Active Immunization Against Tetanus by Vaccination with Tetanus Toxoid. Circular Letter No. 34.—p. 426.
Storage of Mapharsen. Form Letter.—p. 429.
Directions for Use of Yellow Fever Vaccine in Immunization Against Yellow Fever. Form Letter.—p. 429.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

38:1-58 (Jan.-March) 1941

- Purpura in Course of Measles: Case Treated with Vitamin P. A. A. Miller.—p. 1.
Anatomy of Lactating Breast. S. Engel.—p. 14.

British Journal of Radiology, London

14:147-186 (May) 1941

- Inverse Square Law Errors in Gamma Ray Dose Measurements. F. W. Spiers.—p. 147.
Chloroma. T. A. Kemp and E. R. Williams.—p. 157.
Spondylolisthesis Affecting Fourth Lumbar Vertebra. W. M. E. Topping.—p. 162.
Regional Ileitis. G. Friedlaender.—p. 164.
X-Ray Examination in Relation to Treatment of Air Raid Casualties. E. Samuel.—p. 171.
Near Distance Therapy. F. Roberts.—p. 175.
Some Radiologic Observations on Postericoid Obstruction and Anemia. A. S. Johnstone.—p. 177.
Research into Physical Factors Concerned in Indirect Radiography: Paper II. Light Transmission of X-Ray Protective Lead Glass. R. Herz and B. Stanford.—p. 181.

British Medical Journal, London

1:469-500 (March 29) 1941

- *Use of Glycerin-Sulfonamide Paste ("Euglamide") in Treatment of Burns. J. M. Robson and A. B. Wallace.—p. 469.
Digestive Disorders in the Forces. J. G. Graham and J. D. O. Kerr.—p. 473.
Experiences with Sulfanilamide Derivatives in Some Tropical Conditions. K. V. Earle.—p. 476.
Laboratory Infection with Brucella Abortus. H. N. Green.—p. 478.
Convulsion During Nonconvulsive Faradic Shock Therapy. G. Caplan.—p. 479.

Glycerin-Sulfonamide Paste for Burns.—Robson and Wallace outline a method of treating burns of the hands which overcomes the disadvantages of tanning methods. The edema and sepsis under a rigid tan, together with prolonged immobilization, have played their part in limiting movement and causing contracture and, in extreme cases, ischemic necrosis. The principle of the method is the application to the burn of a water soluble sulfonamide in glycerin. The sulfonamide compound (albucid soluble) chosen was known to be innocuous to tissues. As glycerin by itself is unsuitable for surface application, the albucid solution was converted into a paste by adding a suitable quantity of kaolin. The paste produces effects usually associated with cataplasma kaolin, an increase in the flow of lymph containing antibodies and white blood corpuscles which increase the local defense mechanism. To prevent the paste from drying, a small quantity of cod liver oil is incorporated. This may have additional advantages. The treatment of burns with this paste allows early movement. For preparing the paste 5 Gm. of soluble albucid powder is mixed with 100 cc. of glycerin; the mixture is heated cautiously and stirred. While the mixture is still warm, 10 cc. of cod liver oil is added and thoroughly stirred in. This solution is mixed with about 80 Gm. of fine kaolin until a smooth permanent paste is produced. The paste has been used with success in second and third degree burns of the hand, face, scalp and buttocks, in second degree burns of the penis and scrotum, in septic burns following twenty-four hours of wet dressings, and for not extensive second degree burns. An anesthetic may be required for cleansing. Before cleansing or applying the paste, cultures are made from the surface of the burn and from blister fluid. In second degree lesions the affected part is cleansed with gauze wrung out of isotonic saline solution at body temperature. Blisters and loose epidermis are snipped and removed. In third degree burns the surface is gently washed with warm physiologic solution of sodium chloride and all foreign material is removed. The paste is applied thickly on sterile white lint, gauze or linen; for burns of the face, a mask is cut out and put over the burned area. Further dressing is applied if necessary, and the whole is covered with wool and bandaged. In burns of the face and flexure regions the paste and dressings are reapplied daily, but in other parts they may be kept on for three days before being changed. When infection is present it is essential to maintain a high local concentration

of the sulfonamide, and the paste is reapplied daily. At each change of dressing, the affected part is wiped clean with wool pledgets soaked in physiologic solution of sodium chloride or cod liver oil. Most of the burns treated have been of the second degree and have occurred in children. Neither the interval between the injury and admission to the hospital nor the nature of the first aid treatment appeared to influence the ultimate result. The hands, face, abdomen, buttocks, feet, penis and scrotum responded well, whereas the axilla and shoulder region showed less response but nevertheless did well. Pain was experienced by a few patients on application of the paste; irritation was absent. As a rule an early healing surface was obtained and therefore patients were discharged earlier from the hospital. The rate of healing with the paste ("euglamide") compares favorably with that obtained with tannic acid. Satisfactory results were obtained in facial burns. The method allows a certain amount of freedom which cannot be permitted if tannic acid has been used. The results of treating a few burns which involved the whole skin have been promising. The paste has also proved of value in burns which had become septic after coagulating agents were used. In such cases euglamide was applied to the granulating surface after the coagulum was removed and healing was rapid.

Edinburgh Medical Journal

48:289-360 (May) 1941

- Action of Drugs on Human Uterus. J. A. Gunn.—p. 289.
Some Comments on Present State of Cancer Theory. J. P. McGowan.—p. 305.
Note on Use of Sulfapyridine in Pneumonia of Children. R. M. Murray-Lyon and R. W. Biagi.—p. 313.
Use of Oxalated Finger Blood for Routine Hematologic Examination. S. Hay.—p. 317.
Production of Glomerulonephritis in Animals by Injection of Serum from Patients Suffering from Nephritis. B. Schober.—p. 322.
The Lighter Side of Edinburgh Medical Life at the End of the Nineteenth Century. A. C. Brown.—p. 335.

Journal of Neurology and Psychiatry, London

4:1-96 (Jan.) 1941

- Cerebral Vascular Lesions and Tentorial Pressure Cone. R. S. Allison and J. E. Morison.—p. 1.
Mechanism of Contrecoup Injury. A. F. Goggio.—p. 11.
Head Injuries and Meningitis. E. A. Linell and W. L. Robinson.—p. 23.
Effect of Choline-like Substances on Cerebral Electrical Discharges in Epilepsy. D. Williams.—p. 32.
Critical Review: Dementia in Middle Age. W. H. McMenemey.—p. 48.

Journal of Pathology and Bacteriology, Edinburgh

52:155-282 (March) 1941

- Evolution of Carcinoma of Mammary. R. Muir.—p. 155.
Squamous Metaplasia of Columnar Epithelium in Human Cervix. R. Carmichael and B. L. Jefferies.—p. 173.
*Active Immunization Against Gas Gangrene and Tetanus. W. J. Penfold, J. C. Tolhurst and D. Wilson.—p. 187.
Autohemagglutination and Anti-O Agglutinins. G. C. Dockeray and H. Sachs.—p. 203.
Benign Cerebral Telangiectasis: Two Cases. W. Blackwood.—p. 209.
Some Developmental Abnormalities of Thymus and Parathyroids. J. R. Gilmour.—p. 213.
Isolation of Cholesterol from Oily Droplets Found in Association with the L 1 Organism Separated from Streptobacillus Moniliformis. S. M. Partridge and Emmy Klieneberger.—p. 219.
Some Observations on Healing of Experimental Wounds in Skin of Rabbit. J. S. Young, J. A. Fisher and M. Young.—p. 225.
Action of Certain Sulfonamide Drugs on Growth of Bacteria in Urine. J. W. Bigger and P. A. McNally.—p. 247.

Active Immunization Against Gas Gangrene and Tetanus.—Experience with active immunization of 12 volunteers with Bacillus welchii (type A) alum precipitated toxoid suggested to Penfold, Tolhurst and Wilson its use as prophylaxis against gas gangrene in the army. The volunteers received a total of thirty-three injections. There were only local reactions and these were mild and possibly due to traces of formic acid in the formaldehyde used to prepare the toxoids. All the volunteers responded with the production of antitoxin in their serums and the serums injected into mice protected the animals against living cultures of B. welchii. The maximal response of the volunteers following either two or three injections varied from $\frac{1}{20}$ to $\frac{1}{2}$ unit of antitoxin per cubic centimeter of serum.

The courses of immunization varied with the volume of the injections, the intervals between them and the batch of alum precipitated toxoid used. After two or three injections, antitoxin was detectable for at least five months in the serums of 9 volunteers. One of these had antitoxin for at least two and a half years; in 3 others none was detectable after eighteen months. Of the remaining 3 persons, 1 showed antitoxin after two months (his serum was not tested at a later date), 1 had antitoxin after two months but not after fourteen months and 1 had less than $\frac{1}{30}$ unit after three months, when a further injection was given. Three other persons had an extra injection after nine, five and five months. In each instance there was a sharp rise in the antitoxic titer.

Lancet, London

1:437-470 (April 5) 1941

- Effort Syndrome: Diagnostic and Therapeutic Value of Exercises. A. Abrahams.—p. 437.
- *Prognosis of Acute Intestinal Obstruction: Experiments with Intraperitoneal Sulfanilamide. R. V. Hudson, R. Smith and F. R. Selbie.—p. 438.
- Preservation of Blood for Sugar Analysis. R. D. Lawrence.—p. 442.
- *Treatment of Bacterial Endocarditis with Heparin and Sulfapyridine. S. Sevitt.—p. 443.
- Failure of Heparin in Subacute Bacterial Endocarditis. C. M. Fletcher.—p. 444.
- Calcification in Muscles of Forearm. R. Shackman and C. J. Longland.—p. 445.
- Epanutin and Electric Convulsion Therapy. R. E. Hemphitt and W. G. Walter.—p. 446.

Prognosis of Acute Intestinal Obstruction.—Hudson and his associates studied a consecutive series of 670 cases of abdominal obstruction. In 62 a segment of the intestine was not considered viable and a resection was carried out; 48 of these patients died, giving a fatality rate of 77.4 per cent. Of 300 patients with strangulated external hernia 30 required resection; 24 of these died, a fatality rate of 80 per cent. Of the remaining 270 patients having simple release only 18 died, giving a fatality rate of 6.7 per cent. In trying to determine the reason for this significant difference in the prognosis when the intestine changes from viable to nonviable, the authors find that the majority survive the immediate hazards of operation and the next few days. They may die at any time up to six weeks after operation, the most dangerous periods being about the fifth and the tenth day. The symptoms are typical of an increasing mechanical obstruction—colicky pains, exaggerated peristalsis, vomiting and increasing distention. At necropsy the cause of death is found to be a plastic peritonitis of a variable degree, with much adhesion of intestine to intestine and intestine to abdominal wall, and an edematous intestine full of foul material, with multiple sites of obstruction. The author believes that some organisms probably pass through the intestinal wall before operation but not many unless gangrene and perforation are present; the main contamination of the peritoneum probably takes place at operation and is due to the intestine being opened. If the 670 patients are placed in two groups, according to whether the intestine was opened or not, there are 224 whose intestine was opened, of whom 137 died; but of 446 having only simple release 23 died. The prognosis for patients requiring opening of the intestine was necessarily much worse, but the difference is so great as to suggest that opening the intestine provides a new lethal factor sufficient to weigh the scales against the patient. Reduction in the deaths can be attained by earlier diagnosis and by more successful treatment and prevention of the lethal complications which result from delay in diagnosis. With a view to preventing such complications, experiments with intraperitoneal sulfanilamide in rabbits demonstrate that (1) sulfanilamide introduced into the peritoneal cavity was absorbed and caused no local inflammation, (2) contamination of the peritoneal cavity with contents of the cecum produced a plastic peritonitis with the formation of abscesses and adhesions and sometimes general peritonitis, (3) this plastic peritonitis could be prevented by introducing sulfanilamide into the peritoneal cavity at the time of the contamination but not by a single large dose of the drug orally, (4) *Bacillus coli* peritonitis followed resection of intestine with great regularity and (5) prophylactic use of intraperitoneal sulfanilamide usually reduced and sometimes eliminated the inflammatory process, but (6) in the presence of a fulminating infection intraperitoneal sulfanil-

amide was valueless. So far 2 patients having intestinal resection for acute intestinal obstruction have been treated with sulfanilamide intraperitoneally. In neither of them was there any local or general postoperative obstruction or peritonitis.

Heparin and Sulfapyridine for Bacterial Endocarditis.—Sevitt presents histories of 2 patients treated with heparin and sulfapyridine for bacterial endocarditis. Both died from embolic complications. In one the emboli were pulmonary and in the other cerebral. No organisms were seen microscopically on the vegetations of the first patient. Neither patient underwent a full ten to fourteen day course of treatment; had this been possible the results might have been different. The treatment is undoubtedly highly dangerous; similar cerebral accidents have been reported by Kelson and White and by Witts and Fletcher. However, the treatment seems justifiable for what is invariably a fatal disease.

South African Medical Journal, Cape Town

15:121-140 (April 12) 1941

- Mongol Spot in the Cape Colored. S. Matus.—p. 121.
- Vaccination Against Epidemic Typhus in South Africa. M. H. Finlayson and G. M. Grobler.—p. 125.
- Sporotrichosis Among Miners on the Witwatersrand Gold Mines. L. F. Dangerfield and J. Gear.—p. 128.
- Acute Thrombophlebitis of Unknown Etiology. A. C. Fisher.—p. 131.
- *Sulfapyridine as Prophylactic Against Cerebrospinal Meningitis. F. C. Gray and J. Gear.—p. 139.

Sulfapyridine Prophylactic of Cerebrospinal Meningitis.—According to Gray and Gear, a bacteriologic investigation of an outbreak of cerebrospinal meningitis in a military camp in Natal revealed approximately 22 per cent of carriers among those examined, making conditions favorable for a widespread epidemic. As sulfapyridine is known to sterilize the cerebrospinal fluid of patients suffering from meningococcal meningitis within three days, it was thought that it might be equally effective in destroying the organisms in the nasopharynx of carriers. If this could be achieved a sudden diminution of the carrier rate would be expected and there would be an interval during which no further cases would occur. The carrier rate was determined on a sample population of the most severely affected battalion. Then all men of this battalion and carriers found in other units were given two tablets of sulfapyridine three times a day for two days. After one day the carrier rate among the sample population was again determined. As a control the carrier rate among an untreated battalion was also determined. Although 70 treated and only 43 untreated men were examined, no carriers were found among the treated but 10 among the untreated. Of still greater significance is the fact that 17 of the treated men were previously proved to be carriers. Under normal conditions, according to Flack (1917), about 20 per cent of contact carriers are infective for less than two weeks and the remainder for periods up to and for longer than twelve weeks. The carriers whose swabs yield a profuse growth of meningococci tend to be more persistent in their infectiveness. The majority of the carriers that the authors treated were of this type and the results of their bacteriologic investigation have to a certain extent been confirmed by subsequent clinical observations and experience. In the month that has elapsed only 1 case of meningitis has occurred in the battalion treated, an officer who did not receive the treatment contracting the disease. A workman in the lines of this battalion who did not receive the prophylactic treatment died of meningitis. During this period several cases of meningitis occurred among the men of the control battalion until they too received the prescribed course of sulfapyridine. On the basis of their investigations Gray and Gear conclude that mass dosage is an efficient means of controlling an epidemic of cerebrospinal meningitis immediately by reducing the carrier rate to negligible proportions and preventing the onset of the disease in those in whom incubation of the infection occurs. The effect of the drug alone cannot be permanent, but they believe that by taking ordinary hygienic precautions the chances of a recrudescence of the disease in epidemic proportions is remote. They recommend that in the event of a case of cerebrospinal meningitis occurring in a semipermanent military camp the carrier rate should be determined if possible, and if it exceeds 20 per cent mass dosing with sulfapyridine is justified. The ordinary hygienic precautions must not be neglected.

Gazzetta degli Ospedali e delle Cliniche, Milan

62:1-20 (Jan. 5) 1941. Partial Index

***Cultures of Bone Marrow Obtained by Sternal Puncture in Diagnosis of Bubonic Plague.** R. Modica.—p. 11.**Sternal Bone Marrow Cultures in Bubonic Plague.**—

According to Modica the various methods for identifying *Pasteurella pestis* are inconvenient because of time consumed. The author made the usual laboratory tests in 12 cases of plague and cultures of bone marrow obtained by puncture. Microscopic examinations of sputum and of material taken from lymph nodes and cultures from the tissue fluids of the lymph nodes cannot be performed in septicemic types of the infection because adenitis and disorders of the respiratory tract appear late in the course of the disease or do not appear at all. The infection was of the general septicemia type in 3 of the author's cases. Positive results were obtained by microscopic examination of the sputum or of the material from involved lymph nodes in 3 of the 9 cases, by culture of tissue fluid of the enlarged lymph nodes in 1 out of 8, by the biologic test in 7 out of 8, by blood culture in 3, and by bone marrow culture in 10 out of 12. The method of bone marrow culture is simple, harmless and valuable for a rapid diagnosis of the bubonic plague. The method has the same degree of sensitivity as the biologic test, without however the inconvenience of the latter. The test can be applied to patients in any stage and with any of the clinical types of the infection. It is of greater diagnostic value than any other diagnostic test.

Policlinico, Rome

48:193-240 (Feb. 3) 1941. Practical Section

Night Blindness in Diseases of Liver.** G. Bajardi and A. Galeone.—p. 193.Prevention and Therapy of Diphtheritic Paralysis.** F. Recchia.—p. 204.

Night Blindness in Diseases of Liver.—Bajardi and Galeone made photometric determinations of the power of adaptation to darkness in 25 patients with disease of the liver and without ocular disorders. The power of adaptation to darkness was diminished in 16 cases. The diminution was proportional to the degree of involvement of the liver parenchyma and stroma and also to the course of the disease, as shown by the clinical symptoms and the results of laboratory tests. Night blindness was present in cases of acute hepatic disease, especially in Laënnec's cirrhosis. It was related neither to the type of the disease nor to jaundice but depended rather on the acuteness of the disease, the course of which it paralleled. The author found hypovitaminosis A in another group of 18 patients with hepatic disease and night blindness. The latter was proportional to the acuteness of hypovitaminosis and it improved on parenteral administration of vitamin A. The authors conclude that changes in the power of adaptation to darkness show more or less acute dysfunction of the liver. The test is of no value for the diagnosis of the type of disease of the liver. The visual disorder is not caused by the disease itself nor by jaundice. It is caused by hypovitaminosis A, the acuteness of which it parallels. It improves on vitamin A therapy.

Prevention and Therapy of Diphtheritic Paralysis.—Recchia reports a statistical study of 3,990 cases of diphtheria observed in the clinic for infectious diseases in Rome. Thirty-four patients who had had no treatment during the acute stage or who received it late in the course of the disease, or in insufficient doses, entered the clinic with paralysis already established. Paralysis developed within five to ten days in 7 cases, within thirteen to thirty-seven days in 20 cases and within fourteen to fifty-nine days in 7 cases. Antiserum was administered to 3,956 patients during the acute phase of diphtheria in doses varying from 100,000 to 800,000 units in two to five days, alone or with the toxoid. Paralysis developed in 5 of the 3,481 cases of mild diphtheria, in 24 of 347 cases of severe diphtheria and in 38 of the 73 cases of malignant diphtheria. Fifty-five patients with malignant diphtheria died in the course of the first ten days of the disease. Paralysis developed more frequently in patients who had late or insufficient treatment than in those who had sufficient early treatment. It occurred on the ninth day of the disease in 1 case and between the thirteenth and forty-eighth day in 4 cases of moderately severe diphtheria, between the eighth and tenth day in 17 cases of severe and

malignant diphtheria, and between the eleventh and fortieth day in 45 cases of severe and malignant diphtheria. The number of patients with paralysis totaled 101 and will be regarded here in four groups. The first and second group of 24 and 7 patients respectively were patients with severe or malignant diphtheria who received during the acute phase antiserum in doses ranging from 120,000 to 460,000 international units, alone or with toxoid. Local or more extensive paralysis developed between the eighth and the twentieth day in patients of the first group and completely regressed between the twentieth and the fifty-eighth day. Local or more extensive paralysis developed between the fifteenth and the forty-eighth day in patients of the second group. It regressed completely between the fortieth and the eightieth day after administration of the toxoid. The third group was made up of 15 patients with severe and malignant diphtheria who had no treatment during the acute phase of diphtheria or had late or insufficient treatment. Limited or extensive paralysis occurred between the sixth and the ninth day in 4 patients and between the thirteenth and the forty-ninth day in 11. Antiserum in a total dose varying between 100,000 and 500,000 international units and toxoid were administered. Regression with cure of paralysis took place within forty to eighty days in local or moderately pronounced paralysis and within seventy-five to one hundred and twenty days in some cases of extensive paralysis. The fourth group was made up of 55 patients with acute or malignant diphtheria. It included patients who had had no treatment in the acute phase of the disease, those who had insufficient or late treatment and those who had antiserum given in amounts from 200,000 to 500,000 international units during that phase of the disease. Paralysis occurred early in 10 patients and late in 45. The treatment consisted of administration of antiserum up to a total dose of 200,000 international units for patients not previously treated with antiserum, and of 100,000 international units for those who had antiserum in the acute phase of the disease. Recovery from paralysis took place between the twentieth and the hundred and twentieth day of the disease in all forms of local or multiple paralysis, which was controlled by repeated treatment if the condition reappeared after the first or second treatment. The author concludes that antiserum therapy in large doses administered early, in the course of diphtheria, alone or with toxoid diminishes the occurrence of diphtheritic paralysis. The repeated treatment controls recurrence of paralysis. The combined antiserum and toxoid treatment results in cure of limited and more extensive paralysis and of some but not all forms of multiple paralysis. The results of antiserum therapy alone are far superior to those of toxoid alone. Antiserum alone in primary or in repeated treatments produces a cure of diphtheritic paralysis of either limited or multiple types.

Chirurg, Berlin

12:253-284 (May 1) 1940

Question of "Permission for Operation."** A. Hübner.—p. 253.Traumatic Pulmonary Collapse.** L. Zukschwerdt and W. Pickel.—p. 258.**Spontaneous Hemorrhages of Spleen.** J. X. Müller.—p. 265.**Malignant Carcinoids.** F. Koch.—p. 270.**Cysts of Pavement Epithelium on Bones of Fingers.** F. Becker.—p. 275.

Traumatic Pulmonary Collapse.—According to Zukschwerdt and Pickel, pulmonary collapse of traumatic origin has received little consideration. English observers called attention to it during the World War, particularly after gunshot wounds of the lung. The essential element in the traumatic pulmonary collapse is the deflation of a large portion of the lung. Authors' cases of traumatic collapse showed bronchial occlusion to be the cause of the deflation. Occlusion may be due to a thrombus caused by the pulmonary injury, and this may obstruct the bronchus of the injured portion of the lung, with a collapse of the injured side, or the thrombus may be transported, as the result of coughing, to the tracheal bifurcation and be aspirated into the opposite side, causing collapse of the noninjured side. The collapse may result from an injury to the bronchial mucosa with subsequent swelling and narrowing of the lumen, which later becomes completely blocked by mucus. The bronchus may be occluded by a plug of mucus. The gases in the portion of the lung distal to the occlusion

become absorbed. Suction toward the diseased part of the lung is transmitted to the surrounding organs. Elevation of the diaphragm, narrowing of the intercostal spaces, displacement of the mediastinal organs with the shift of the heart take place. Of the greatest functional significance is the displacement of the vessels at the base of the heart, because it interferes with their emptying. Added to this is the impairment of the circulation by excessive filling of the damaged lung with inadequately arterIALIZED blood. The engorgement leads to circumscribed pulmonary edema, which may terminate in pneumonia or an abscess. If the causal factor is a thrombus the collapse may follow immediately on the injury, but if a plug of mucus is responsible several days may elapse before collapse takes place. The clinical signs are the same as in the postoperative collapse. Displacement of the heart toward the affected side (sign of Heller-Pasteur) is classic. An area of dulness with weakened respiratory sounds or with distant bronchial breathing and some crepitation are present in the beginning. Later the condition is that of a "dead lung." Roentgenoscopy is most reliable, because it discloses displacement of the heart and trachea. The temperature rises, the pulse becomes small and rapid, the face, at first brick red, soon becomes cyanotic. The expression is anxious, respiration superficial and accelerated. The course of traumatic pulmonary collapse varies. Bronchial occlusion may be cleared by coughing or by discharge of the secretion. Early death may be caused by mediastinal displacement. Many of the unexplained circulatory failures after chest injuries belong to the latter group. The persistence of the occlusion may lead to pneumonia, abscess, gangrene and empyema. Early treatment with substances which dissolve mucus is indicated. The authors used an aqueous solution of guaiacol or a solution of eucalyptus, menthol, acetanilid and phenyl-dimethyl pyrazolon in a nonacid oil, also inhalations. Hyperemia is produced by mustard plaster, by short waves or by turning the patient on the healthy side and back. Not too much time should be spent on these measures, especially if signs of circulatory collapse appear. If coughing does not clear the obstruction, a pneumothorax is indicated. The pneumothorax counteracts the mediastinal displacement. The circulation becomes normal and the suction on the occluding obstruction ceases, so that it can be expelled by coughing. Administration of remedies which dissolve the mucus should be continued. Adequate ventilation of the lung can be promoted by carbon dioxide. The authors are convinced that pneumothorax therapy is the method of choice. The pneumothorax should not be too extensive so as not to exclude too much of the healthy pulmonary tissue from respiration. The authors did not introduce more than 300 cc.

Deutsche medizinische Wochenschrift, Leipzig

66:1413-1440 (Dec. 20) 1940

Pneumonic Types as Determined by Reactive Status of Person. Frobenius.—p. 1416.

*Artificial Respiration and Resuscitation. R. Eisenmenger.—p. 1420.
Asphalt as Antigenic Agent. R. Hasche-Klunder.—p. 1422.

Artificial Respiration and Resuscitation.—According to Eisenmenger, experiments in artificial respiration and resuscitation conducted on recently dead bodies of animals and man demonstrated that the abdomen constitutes the only peripheral site at which respiration as well as circulation can be favorably influenced at the same time and that best results are obtained by apparatus mechanically controlling alternation of air pressure and air suction. The modern theory, revised from one held twenty years ago, is that what counts is not the amount of oxygen, expressed in cubic centimeters, passed through the lung but the simultaneous action on the heart and circulatory system by which the actual passage of the air to the capillaries of the lungs, heart and brain is assured in the shortest possible time and carbon dioxide eliminated. In serious cases of asphyxia in which respiration and circulation are involved, the latter constitutes the problem to be attacked first. It is with this end in view that intracardiac injections of epinephrine are made into the myocardium or right cardiac cavity to stimulate the heart and restore circulation. Direct cardiac massage in operative cases in which the heart is exteriorized and manipulated by the hand of the surgeon similarly is intended to incite the action

of the heart. Both procedures need to be accompanied by artificial respiration. Biomotors are of two kinds, of over pressure and under pressure (überdruck and unterdruck). In the former an increased intrapulmonary pressure supervenes in the respiratory tract which affects the lesser circulation. In the latter, normal pressure relations prevail. By means of artificial pressure and suction apparatus in animal experimentation, epinephrine, caffeine and other drugs, intravenously injected, could be made to reach the heart and the central circulation even after the heart had already ceased its activity. Chemical agents can affect the nerve centers and thus influence blood circulation and distribution only if circulatory function still exists. If cardiac and circulatory action has already slowed down or ceased, mechanical intervention is in order. The author was able to observe the admirable results of mechanical resuscitation in cases of suffocation. Here cyanosis disappeared in from two to three minutes, consciousness was restored, acute liver enlargement receded and the patient could be promptly given nourishment. Artificial respiration by mechanical means may also be applied in serious cases in which sudden death appears to impend but no grave organic trauma is manifest and cardiac paralysis and acute circulatory insufficiency have not yet set in.

Klinische Wochenschrift, Berlin

19:409-432 (May 4) 1940

*Surgical Treatment of Hypertension. W. Nonnenbruch.—p. 409.
Aspects of Mediastinal Stasis. R. Schoen.—p. 413.
Anemias Resulting from Deficient Differentiation of Erythroblasts. R. Duesberg.—p. 417.
Dark Adaptation in Healthy Well Nourished Persons: Investigations on Range of Scattering with Adaptometer of Engelking-Hartung. R. Pies and H. Wendt.—p. 419.
Question of Surgical Treatment of Hepatocellular Icterus. W. Gros and W. Siede.—p. 420.
Casuistics of Acute Anterior Poliomyelitis. E. Altenburger.—p. 423.

Surgical Treatment of Hypertension.—Nonnenbruch advocates surgical treatment of hypertension for suitable cases. Kidney decapsulation and denervation of the renal hilus or combination of the two is one of the methods. Investigations suggest that the kidney influences blood pressure by humoral as well as by reflex action. The latter probably originates in the nerves of the capsule and in the pressoreceptor zones of the renal vessels. The second group of surgical interventions includes those on the sympathetic nervous system and on the adrenals, namely (1) unilateral and bilateral splanchnicotomy, with and without removal of the first and second lumbar ganglions and of the celiac ganglion; (2) removal of one or of a portion of both adrenals. Both groups of operations have also been combined in various ways. In the method of Adson and Craig, a subdiaphragmatic sympathectomy is combined with removal of the first and second lumbar ganglions and of a part of the celiac ganglion and with a partial excision of the adrenals. This method was employed also by Kirschner and by Schmieden. Analysis of cases of hypertension in which surgical treatment was employed reveals four different groups: (1) hypertension with true nephritis, (2) essential hypertension, (3) malignant nephroangiosclerosis and (4) blood pressure crises. The author emphasizes that an agreement must be reached as to what constitutes essential hypertension. The term should be applied only to cases with so-called benign sclerosis according to Volhard and Fahr, that is to cases of red hypertension, whereas cases of pale hypertension should be referred to as malignant sclerosis or as malignant hypertension. The two conditions differ. Red hypertension, as a rule, does not develop until the fifth or sixth decade of life and may persist for decades without impairment of the working capacity. In these cases surgical treatment is not necessary. However, in the early forms of malignant sclerosis and pale hypertension surgical treatment is advisable, for best results were obtained in such cases. They differ from benign sclerosis in that the patients are younger. Hypertension may be the only symptom for a long time, but the retinal vessels are as a rule considerably constricted. In some cases visual disturbances precede other symptoms by years, and an angiospastic retinitis or a cerebral attack caused by spastic ischaemia is the first indication of the disorder. Urine and renal function may be entirely normal. According to Volhard pale hypertension is due to a hematogenically increased resistance in the arterioles, whereas red hypertension

is due to a decrease in the flexibility of the large arteries. The characteristic of the resistance hypertension is that the diastolic pressure is also high. In red hypertension, however, the systolic pressure is increased but the pressure falls considerably during diastole. In so-called malignant sclerosis there exist arteriosclerosis and a functional spasm. The latter may change in intensity, which explains a possible lack of stability of the blood pressure. The less fixed the hypertension, the more favorable the prospects of a successful operation. There are cases of pale hypertension in which the functional factor is primary. Such are cases of medullary tumors of the adrenals accompanied by hypertensive crises, also cases which begin with eclampsia. Cases with high pressure crises and normal pressure during intervals require careful observation. Surgical treatment is indicated in cases of paroxysmal hypertensive crises in which a paraganglion of the kidney is suspected, and also in early cases of malignant sclerosis in which clinical signs of renal disturbance are still absent. Surgical intervention to be considered first is renal decapsulation and interruption of the nerve trunks at the renal hilus. It is doubtful whether subdiaphragmatic sympathectomy with resection of the ganglions is justified. Further observations will be necessary to decide whether in cases of malignant sclerosis with permanent hypertension in which a paraganglion of the adrenal exists it is advisable to remove also one of the adrenals.

19:1321-1370 (Dec. 28) 1940. Partial Index

Number of Fluoresceins in Human and Animal Blood. E. Chytrek.—p. 1321.

Technic of Suboccipital Puncture for Functional Examination of Cerebrospinal Barrier. Vonkennel.—p. 1328.

*Comparative Explanation of Gastritis by Means of Gastroscopy and Stereoroentgenoscopy. L. von Friedrich.—p. 1333.

Gastroscopy and Relief Roentgenography in Gastritis.—Von Friedrich appraises the diagnostic value of the gastroscope in comparison with that of the mucosal relief roentgenograph on the basis of 273 cases of gastritis (atrophic gastritis 20, hypertrophic 140, ulcer complication 93). The mucosal relief roentgenographic examinations were simultaneously made by an independent investigator. While admitting the mutually complementary character of these diagnostic aids for gastritis, the author found gastroscopy superior, for though the roentgenograms report accurately the contours, movements and food passage of the stomach, they cannot determine the structure, color, nature and processes of the gastric mucosa. The atrophic type of gastritis, the nondiffuse, localized type (of greatest incidence), the hemorrhagic and erosive type, the postoperative type (counted among the most serious types of gastritis) and gastritis associated with ulcer all can be diagnosed accurately only by means of the gastroscope. What makes the explanation of gastritis difficult is the fact that the various types of gastritis have no specific causative agent nor do they present characteristic symptoms by which they might be identified. Unknown constitutional, endocrine and other factors affect the picture in each case. Repeated gastroscopic examinations of the same persons demonstrated not only the possibility of healing but the progress of the cure. The mere presence of coarse irregular folds and serrations in the greater curvature seen in stereoroentgenograms do not justify the diagnosis of gastritis or permit identification of the particular form of gastritis. The gastroscopic technic is simple, but the correct interpretation of the observations requires long experience.

Bulletin of the Naval Medical Association, Tokyo

29:833-894 (Dec.) 1940. Partial Index

*Two Cases of Osteomyelitis of the Frontal Bone. T. Masuoka.—p. 879.

Osteomyelitis of the Frontal Bone.—The incidence of osteomyelitis of cranial bones is rare, the statistical survey of 909 cases of osteomyelitis treated in the Tsukiji Charity Hospital, Tokyo, revealing only 0.22 per cent in the fifteen year period. The first patient seen by Masuoka was a woman 18 years old, who had a staphylococcal infection of the frontal bone following an injury to the forehead three years previous to admission to the hospital. Under local anesthesia the infected material was removed, together with two sequestrums

embedded in granulomatous tissue; the patient went on to uneventful recovery. The second patient was a girl 4 years old, in whom frontal osteomyelitis followed abscess formations over the upper eyelids on both sides. The suppurative process extended into the intracranial tissues, causing an abscess of the frontal lobe of the brain and leptomeningitis of the base of the brain. The patient died. The author strongly recommends early and radical removal of the infected tissues, together with such chemotherapeutic measures as administration of sulfanilamide in full doses.

Klinicheskaya Meditsina, Moscow

18:1-136 (No. 10) 1940. Partial Index

Postoperative Massive Collapse of the Lung. K. A. Shchukarev.—p. 3.
Pathogenesis and Therapy of Hemoptysis. V. A. Chukanov.—p. 15.

*Problem of Grip in Pulmonary Tuberculosis. G. P. Rubinshteyn and F. M. Mandelshtamm.—p. 26.

*Liver and Bile Tract Involvement in Pneumonia. V. V. Gerbst.—p. 61.

Electrocardiograms in Lobar Pneumonia. I. S. Shmitser.—p. 69.

Grip and Pulmonary Tuberculosis.—Rubinshteyn and Mandelshtamm state that, of 648 patients admitted with the diagnosis of grip, roentgenologic studies revealed some tuberculous pulmonary lesion in 109, or 16.8 per cent. Of the 109, 21 presented single or multiple calcified foci or shrunken apexes with calcified foci and no signs of activity. These old lesions obviously had no relation to the attack of grip. Subtracted, this would leave 89, or 13 per cent. The authors made roentgenologic studies at periods varying from two months to three years after an attack of grip in 326 patients who, at the time of the grip attack, presented no roentgenologic signs of pulmonary tuberculosis. They failed to find a single case of pulmonary tuberculosis. Of the 109 grip patients with roentgenologic demonstration of pulmonary tuberculosis 18 presented infiltrative lesions, 71 inactive focal fibrous lesions and 20 fibrous cavernous process. In 71 (80 per cent) roentgenologic studies failed to reveal activation of the tuberculous process. Observations on 112 sanatorium patients with pulmonary tuberculosis revealed an incidence of 2.3 per cent of grip as compared with 10.3 per cent of incidence of grip in the hospital personnel. The authors conclude that grip apparently does not alter the reaction of the organism to tuberculous infection and does not favor the development of tuberculosis in areas previously free from tuberculosis on roentgenologic investigations. In the majority of the cases grip does not activate preexisting pulmonary tuberculosis. The authors have no data on which to base an opinion with regard to the effect of grip on the active fibrosing cavernous lesion. There are no characteristic symptoms capable of differentiating a flare-up of tuberculosis from that of grip. Tuberculous patients present a smaller incidence of grip and a milder course. The two infections are apparently not related to each other except for the similarity in the clinical picture.

Liver and Bile Tract Involvement in Pneumonia.—Gerbst studied 73 cases of lobar pneumonia and 27 cases of grippous bronchopneumonia with particular attention to the involvement of the liver and the bile tracts. He found that the abdominal syndrome complicating pneumonia manifests itself more clearly in the right upper quadrant than in the right lower quadrant. Pathologic alterations in the liver, gallbladder and bile tracts constitute one of the earliest and most frequent complications of pneumonia. Angiocholecystitis can be demonstrated clinically in 100 per cent of the cases with localization of the pneumonic process in the right lower lobe. With localization in the left lung the symptoms of liver-bile tract involvement were clearcut in 85.7 per cent, suggestive in 7 per cent and absent in 7 per cent. In grippous bronchopneumonia clinical symptoms of angiocholecystitis were present in 63 per cent. The pathologic alterations observed in six necropsies consisted of inflammation or of stasis of the gallbladder associated with dyskinesia of the bile tracts. The liver exhibited areas of focal hepatitis, necrosis, periangiocolitis and cholangitis. These alterations are, as a rule, reversible. The author believes that toxic factors of hematogenous character are responsible for these early lesions complicating inflammatory processes in the lung.

Book Notices

Report of the Blood Transfusion Association Concerning the Project for Supplying Blood Plasma to England, Which Has Been Carried on Jointly with the American Red Cross from August, 1940, to January, 1941. Narrative Account of Work and Medical Report. Paper. Pp. 121. New York: The Association, 1941.

In August 1940 the Blood Transfusion Association in New York was asked to aid in the development of plasma for shipment to England. This body was formerly known as the Blood Transfusion Betterment Association and first began its work in 1929. More recently it has been determined that all medical aid to Britain shall come through the American Red Cross. The record as here produced is an indication of an important activity and has value as a scientific medical document. Four thousand seven hundred and twelve liters was delivered for shipment to England; one shipment consisting of 222 liters was lost by the sinking of the *S. S. Western Prince*. The association not only aided in the collection of blood but provided funds for the study of new technics for drying plasma and has also developed a plan for collecting a hundred thousand different bloods. A bibliography is appended to this book.

Cancer and Occupation in Denmark 1935-1939. By Johannes Clemmensen, M.D. The Translation into English by Robert Fraser. Paper. Pp. 75. Copenhagen: NYT Nordisk Forlag-Arnold Busck, 1941.

This study is based on the official records of the Danish National Health Service, which are known to be well kept. It was supported by the Danish Anti-Cancer League, which has one hundred and fifty thousand members. As the population of Denmark is about $3\frac{1}{2}$ millions, approximately one person in twenty-three is a member of the Anti-Cancer League. First come discussions of earlier Danish cancer statistics, the character of the Danish death certificates and the regional distribution of cancer in Denmark. The yearly deaths from cancer during 1935-1939 were 140 per hundred thousand of population. Then follow the classification of male "bread winners" in Denmark according to occupation with tables and analytic diagrams of the cancer mortality of the different occupation and age groups, general as well as according to sites. The outstanding result of the work "is the low mortality from cancer in agriculture and the high mortality from that cause in industry, in the age group 45-64," which, as the author puts it, "very strongly suggests that also in Denmark [as in certain other countries] occupation has a bearing on the development of the malignant growths." The significance of these results with respect to prevention of cancer is emphasized and the need of comprehensive statistical studies of cancer, morbidity as well as mortality, in relation to occupation is urged. The normal conditions in Denmark would be especially favorable for the establishment of such a center. "At a first glance it may perhaps seem that this will be a very expensive way of proceeding, but in practice it will be a far shorter way to knowledge about human cancer than the untold costly experiments on animals that are going on the world over, while we neglect the registration of the great, unhappy experiment which nature itself is carrying out on our fellow man."

Clinical Pellagra. By Seale Harris, M.D. Assisted by Seale Harris Jr., M.D. With foreword by E. V. McCollum, Ph.D., Sc.D., LL.D., Professor of Biochemistry, School of Hygiene and Public Health, the Johns Hopkins University, Baltimore. Cloth. Price, \$7. Pp. 494, with 70 illustrations. St. Louis: C. V. Mosby Company, 1941.

The book is divided into an introductory chapter and seven sections dealing successively with history and epidemiology, the quest for the cause of pellagra, etiology and pathology, clinical investigations, symptomatology, diagnosis and prognosis, prophylaxis and treatment. These sections and chapters present a mixture of the good and the poor. For example, nowhere else can the student of pellagra find as complete a history of the disease, such a detailed yet clear description of the clinical pictures (well illustrated by photographs) found in pellagrins or the excellent summaries of recent clinical investigations into pellagra as conducted at Duke University and the University of Georgia. On the other hand, the chapter on the genesis of pellagra appears to have been written by one who resents the

intrusion of nicotinic acid and other vitamins into a long held theory based on hypothetic toxins present in corn and alcohol. He states that "thus nicotinic acid deficiency in pellagra resulting from ingestion of toxins in corn products appears to be one of the many predisposing causes of the disease." Similarly the author attributes "alcoholic" pellagra partly to toxins present in the beverage and neglects entirely the fact that alcohol furnishes a vitamin free source of calories, which is sufficient to explain the examples chosen by the author to illustrate the toxic effects of alcohol in the production of pellagra. In the preface the author states "I have endeavored to write a factual treatise on pellagra in which the various phases of the subject are discussed, including summaries of the most important contributions by those who may be regarded as authorities on the subject." In general, the aim of the author to present a factual treatise on pellagra has been well done. It is when the author deviates from his purpose into a philosophic interpretation of the factual data that the book suffers.

Spermatozoa and Sterility: A Clinical Manual. By Abner I. Weisman, M.D., Clinical Assistant Visiting Gynecologist and Obstetrician, Metropolitan Hospital, New York. With a foreword by Robert L. Dickinson, M.D. Cloth. Price, \$5.50. Pp. 314, with 77 illustrations. New York & London: Paul B. Hoeber, Inc., 1941.

Male sterility as a factor in childless marriages has been generally recognized only during the past twenty years. The knowledge of the spermatozoon has been meager, and textbooks of physiology contained little if any information. This book constitutes the first complete study of the subject. It fills, therefore, an urgent need. It covers the ground from the earliest history to latest advances, i. e. up to 1940, and is a valuable aid to every one interested in any of the phases of spermatozoal research. The practical application of the biologic, physical and chemical findings in the diagnosis and management of sterility in the male is extensively discussed and concise information is given, so that the book should be a great help for the practitioner working in this field. Chapters are devoted to the anatomy, physiology and chemistry of the spermatozoon, their metabolism and the composition of the seminal fluid. In others, causes of sterility in the male, methods for obtaining and transportation of specimen and evaluations are given. The influence of temperature, pH and female genital secretions are discussed, among other subjects. The chapter concerning sterility produced by antibodies against spermatozoa is less critically reviewed than other subjects. The literature is partly misquoted, and conclusive experiments reported in 1940, excluding the possibility of temporary sterilization by spermatoxins, are not mentioned. The book is well bound and clearly printed.

Die Methoden der Fermentforschung. Unter Mitarbeit von Fachgelehrten. Herausgegeben von Prof. Dr. Eugen Bamann und Prof. Dr. Karl Myrbeck. Lieferungen 2, 3 und 4. Paper. Price, 22.80 marks; 29.40 marks; 30.60 marks. Pp. 173-476, with 6 illustrations; 477-868, with 249 illustrations; 869-1276, with 177 illustrations. Leipzig: Georg Thieme, 1940.

The standard of thoroughness and clarity of presentation set by the first section of this reference work previously reviewed in THE JOURNAL has been well maintained if not surpassed in the present volumes. Section II continues the description of substrates, with papers on starch and glycogen and their split products, the uronic acids, the hexosphosphates, nucleic acids and polypeptides. The excellence of presentation is assured by the choice of the respective authors, e. g. Hirst and Peat on ascorbic acid, Abderhalden on polypeptides, and so on. Section III deals with the various methods used in the analysis of substrates, products and enzymes. These include, among others, roentgen ray analysis (Astbury) and the use of the polarigraph, ultracentrifuge methods (Lamm). Redox-potential measurements are described by Jürgen Lehmann. Chapters on the setting of the experimental conditions to be observed in enzyme work close this volume. Section IV continues with a detailed description of chemical methods for the analytic determination of a large group of organic substances as well as the use of colorimetry, spectroscopy and fluorescence measurements. Sufficient theoretical background for these methods is given to make this more than a mere practical manual. This volume also contains chapters on the use of manometric methods (by

Dickens) and the preparation of soluble enzymes from bacteria (by Werkman and Wood) as well as from plant and animal tissues. The text is printed in such a manner that quick reference is facilitated. However, all references to the literature are relegated to one volume, which will appear separately. The reviewer would have preferred to see the bibliography appended to the end of every chapter, even though this would have introduced a certain amount of duplication. At present, before all the sections of the handbook have been issued, reference to the original papers for further details is well nigh impossible. However, it can be said now that the work when completed will prove indispensable to all workers in biochemistry in view of the ever expanding interest in the field of biologic catalysts.

Medical Problems of Old Age. By Louis I. Dublin, Howard T. Karsner, O. H. Perry Pepper and Barney Brooks. University of Pennsylvania Bicentennial Conference. Paper. Price, 50 cents. Pp. 46, with 6 illustrations. Philadelphia: University of Pennsylvania Press, 1941.

Chemotherapy. By E. K. Marshall Jr., John S. Lockwood and René J. Dubos. University of Pennsylvania Bicentennial Conference. Paper. Price, 50 cents. Pp. 42, with 6 illustrations. Philadelphia: University of Pennsylvania Press, 1941.

The Relation of Diseases in Lower Animals to Human Welfare. By John R. Mohler, Raymond A. Kelsner and Cassius Way. University of Pennsylvania Bicentennial Conference. Paper. Price, 50 cents. Pp. 39. Philadelphia: University of Pennsylvania Press, 1941.

Modern Aspects of the Antituberculosis Program. By J. Burns Amberson, Kendall Emerson, William Charles White and Louis I. Dublin. University of Pennsylvania Bicentennial Conference. Paper. Price, 50 cents. Pp. 38. Philadelphia: University of Pennsylvania Press, 1941.

Female Sex Hormones. By Edward A. Dolsy, Philip E. Smith, Robert T. Frank and Elmer L. Sevringhaus. University of Pennsylvania Bicentennial Conference. Paper. Price, 50 cents. Pp. 58. Philadelphia: University of Pennsylvania Press, 1941.

Nutrition. By Conrad A. Elvehjem, Cyril N. H. Long and Elmer V. McCollum. University of Pennsylvania Bicentennial Conference. Paper. Price, 50 cents. Pp. 46. Philadelphia: University of Pennsylvania Press, 1941.

Therapeutic Advances in Psychiatry. By Edward A. Strecker, Abraham A. Brill, Nolan D. C. Lewis and Arthur H. Ruggles. University of Pennsylvania Bicentennial Conference. Paper. Price, 50 cents. Pp. 35. Philadelphia: University of Pennsylvania Press, 1941.

Problems and Trends in Virus Research. By Thomas M. Rivers et al. University of Pennsylvania Bicentennial Conference. Paper. Price, 75 cents. Pp. 75, with one illustration. Philadelphia: University of Pennsylvania Press, 1941.

From the University of Pennsylvania Press has come a series of booklets representing the lectures presented at the bicentennial conference. They represent an excellent inventory of our scientific knowledge in the field of medicine and health to which a number of distinguished investigators have contributed. The fields concerned are the medical problems of old age, chemotherapy, the relation of diseases in lower animals to human welfare, modern aspects of the antituberculosis program, female sex hormones, nutrition, therapeutic advances in psychiatry and problems and trends in virus research. The books are sold at most reasonable prices and offer opportunity to every reader to bring himself promptly abreast of current thought in the fields concerned.

The Chemical Action of Ultraviolet Rays. By Carleton Ellis and Alfred A. Wells. Revised and enlarged edition by Francis F. Heyroth, M.D., Ph.D. Cloth. Price, \$12. Pp. 961, with 159 illustrations. New York: Reinhold Publishing Corporation, 1941.

The revision follows the same general plan of the original work published in 1925 but, as compared to the 362 pages in the first edition, comprises more than 950 pages. The text is not only a review of the mass of literature but also an effective analysis of the significance of the many contributions and is, as well, a complete manual for the investigator. The work would profit by the inclusion of more illustrative material in proportion to the profundity of the text. There is a disproportionate distribution of illustrations, e. g. there are four plates in the twenty page chapter on the commercial production of vitamin D but only ten in the preceding hundred pages dealing with the physiologic and therapeutic effects of ultraviolet rays. There is a somewhat better balance in the sections dealing with other industrial and commercial phases of the subject, which is a rich source of technical information that should be consulted by every one interested in the general problem of photochemistry.

Applied Physiology. By Samson Wright, M.D., F.R.C.P., John Astor Professor of Physiology, University of London, London. Seventh edition. Cloth. Price, \$7. Pp. 787, with 366 illustrations. New York & London: Oxford University Press, 1940.

This is the seventh edition of a volume first produced in 1926. It is the twelfth printing. This in itself should indicate the quality of the work. The volume begins with two quotations which are well worthy of repetition as setting the key of the text:

The simple believeth every word; but the prudent man looketh well to his going (Proverbs 14:15).

The student must continue to read good English and especially poetry, not only because the use of words is vital to the doctor but also that he may retain the flavor of a lovely language while he is studying from his textbooks (*Lancet*, Student Number, August 1939).

In his preface the author calls attention to the great accumulation of new information in the field of physiology. He points out that there have been over fourteen thousand abstracts of articles in this field published since 1939, and he hopes that he has been able to select the material of most permanent value for inclusion in his book. Indeed he submits in his preface page references to each of the places in which new information has been added. There are also one hundred and eighteen new illustrations.

Education for Family Life. Nineteenth Yearbook. Cloth. Price \$2. Pp. 368, with illustrations. Washington, D. C.: American Association of School Administrators, 1941.

The American Association of School Administrators is studying the reasons for the breaking down of the home as the center of family life. This book is a report of the work of that organization. It supplies numerous recommendations that are helpful in this work, a bibliography, a report of the secretary and a list of the members.

Annual Review of Physiology. James Murray Luck, Editor. Victor E. Hall, Associate Editor. Volume III. Published by the American Physiological Society and Annual Reviews, Inc. Cloth. Price, \$5. Pp. 784. Stanford University: Annual Reviews, Inc., 1941.

This volume is a compilation of the latest available physiologic data regarding many basic topics. The editors point out in the preface that they have been limited in their work by the failure of some of the reviewers to secure the most recent literature and by the failure of the editors to secure the cooperation of some colleagues who are engaged in war work. The volume offers a great deal of valuable information and is a most useful work of reference in the field of physiology.

Focus on Africa. By Richard Upjohn Light. Photographs by Mary Light. Foreword by Isalah Bowman, President, The Johns Hopkins University, Baltimore. Cloth. Price, \$5. Pp. 228, with 324 illustrations. New York: American Geographical Society, 1941.

Today Africa is the battleground of Europe's rivalries. Therefore every one has a far greater interest in that continent than previously prevailed. It is fortunate to have available this magnificent presentation of Africa by the American Geographical Society—a book based on airplane study with innumerable excellent photographs. Here are exceedingly valuable data concerning terrain and the population, and information regarding airports, maintenance and history of such developments as Uganda and Kenya settlements. There is a section on preservation of wild life and on the development of the radio. Finally there is an excellent bibliography and an index.

A History of Magic and Experimental Science. Volumes V and VI: The Sixteenth Century. By Lynn Thorndike, Professor of History, Columbia University, New York. Cloth. Price, \$10, per set. Pp. 695; 766. New York, Morningside Heights: Columbia University Press, 1911.

These two volumes in this remarkable series deal with the sixteenth century. Here is a scientific account of the beginning of astrology, of the foundations of German medicine, the coming of Fracastoro, the rise of anatomy, of Jerome Cardan and Paracelsus. Here also is the story of the medicine of the period after 1550—superstitions relating to gems, divination and the literature of witchcraft and magic. This is certainly a most valuable contribution for all who are interested in the evolution of folk medicine and quackery.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

CHIGGER INFESTATION

To the Editor:—I am an officer in the Army and would like information on the redbug, or chigger. This has been a serious problem, especially when we are out in the field. I should like to know (1) the life cycle of the insect, (2) method of entering the skin, (3) what happens to the insect after penetrating the skin, (4) what drug or drugs to use in prevention, (5) what treatment after the insect has caused the lesions and (6) does this insect attack other animals?
M.D., Texas.

ANSWER.—1. The chigger is the six legged red larva of the division of Arthropoda, class of Arachnida, order of Acarida, section of Prostigmata, family of Trombididae. The eight legged adult is a scavenger and in the spring, after spending the winter underground, it deposits eggs on the ground and on low plants. In four weeks six legged larvae hatch. They are active and measure an average of 0.52 mm. in length and 0.31 mm. in width. Apparently these larvae must lead a parasitic existence in order to survive, and their hosts are reported to include domestic animals, rodents, birds, certain reptiles and man. The larva does not change hosts; it rarely remains attached longer than two to four days and then drops off, engorged with a fatty predigested tissue juice (not blood). Then it goes into a pupal form, and in a week or two a colorless, eyeless eight legged nymph emerges. After a few more days a second nymph form appears, and after two or three more weeks the nymph becomes an adult. The nymphs and adults live on plants and decayed vegetation. They are scavengers and do not parasitize man or animals. There is only one generation of chiggers each year.

2. When a person walks through grass or underbrush he may become infested as he comes in contact with vegetation on which the chiggers are presumably located. Perhaps they may also be found on the leaves of small trees. They may invade the skin of the host from the feet and ankles upward or, less commonly, from the neck and shoulders downward. They run at the rate of about 10 cm. per minute and are most likely to attach themselves at points where they meet an obstacle, such as a constricting garter or belt. They prefer areas where the epidermis is thin. The bite is usually, but not always, at the mouth of a follicle, the mite being fastened temporarily as a red speck at the center. The larva does not burrow but remains fastened on the surface, like a tick, merely piercing the epidermis as deeply as possible with its pointed mandibular claws. The symptoms are probably caused by the digestive secretion of the mite, which flows into the wound. A pruritic papule or papulovesicle appears.

3. The mite becomes engorged and usually drops off after a few hours and can rarely be found unless the patient is seen early.

4. Infestation may be prevented by dusting the skin with sulfur or by wearing protective clothing.

5. There are three objectives in treatment: (1) the removal of the mites, (2) the relief of the severe itching and (3) the treatment or prevention of secondary infection. To remove the mites, if still present, kerosene may be applied, followed by a half hour of bathing with plenty of soap and a complete change of clothing. Active mites may remain in infested clothing. Since the objective and subjective symptoms usually continue unabated for days after the parasite has been removed, the fulfillment of the second and third objectives is of the greatest importance and may best be accomplished by touching the lesions with 70 per cent alcohol (rubbing alcohol) three times a day and as needed, followed immediately by a mild antiseptic antipruritic ointment, such as boric acid ointment U. S. P., to which may be added from 1 to 2 per cent of phenol, the strength of course being in inverse proportion to the area of skin to be covered, and 0.2 per cent of menthol. This ointment should be applied sparingly at least three times a day (after alcohol) and used also as needed to relieve itching; it is to be rubbed in gently, and the remainder is wiped off with cotton. A little plain talcum may then be dusted over the surface. Scratching must be prevented, and canvas gloves may have to be worn during sleep for this purpose. If serious secondary infection has occurred, of course other measures may be used as indicated.

6. This mite is a larval acarid and not an insect. It attacks sheep, goats, cattle, dogs, house cats, monkeys, rabbits, squirrels, moles, rats, house and field mice, bats, hedgehogs, shrews, voles, opossums, tinamous, domestic fowl and certain ground nesting birds, frogs, toads, salamanders, lizards, certain snakes, land turtles, insects and arachnids.

References:

- Toomey, Noxon: Trombidiasis (*Leptus Autumnalis*), *Urol. & Cutan. Rev.* 25: 598 (Oct.) 1921.
Parkhurst, Howard J.: Trombidiosis (Infestation with Chiggers), *Arch. Dermat. & Syph.* 35: 1011 (June) 1937.

HIGH TEMPERATURES AND HEMIPLEGIA

To the Editor:—A man aged 59 has had cordiorenol hypertension for many years. He has worked for twenty years stoking a furnace. Four months ago he worked all day as usual and felt well, complaining however of the heat more than usual. He walked home 2 miles as was his custom. Four hours after his evening meal he was stricken with a hemiplegia. The man is claiming that the hemiplegia was caused by the heat and his occupation as stoker. What are the possibilities of this being the case? How long after being overheated do symptoms of heat stroke appear? Will you also give me some references regarding heat stroke causing hemiplegia?
Philip C. Thomas, M.D., Knoxville, Tenn.

ANSWER.—It is first necessary to distinguish between a heat stroke and a stroke in the common sense, such as a cerebral hemorrhage, which would cause hemiplegia. Exposure to high temperatures, especially associated with high humidity, may lead to a train of symptoms varying from cramps to sudden death. If the condition is merely one of heat exhaustion the mouth temperature is usually normal but sometimes may be persistent if the exposure to heat continues, as in the tropics.

Heat stroke or sun stroke is accompanied by a marked elevation of temperature, from 106 to 109 F. This may come on suddenly, and consciousness is usually lost early in the attack. If the patient survives for several days, recovery is usually complete; but susceptibility to heat and impairment of memory are common results.

It is obvious in the face of these facts that a patient 59 years old who has had hypertension for many years and has worked for twenty years at the same employment of stoking a furnace, even though this would expose him to heat, could not attribute a hemiplegia coming on four hours later to his occupation; at least it is unlikely that this contention is probable, and it is quite unlikely that the two are associated.

References:

- Glover, D. M.: Heat Cramps in Industry, *J. Indust. Hyg.* 13: 347 (Dec.) 1931 (bibliography).
Morton, T. C. St. C.: Etiology and Treatment of Heat Exhaustion and Heat Hyperpyrexia, *Proc. Roy. Soc. Med.* 25: 261 (June) 1932.
Sayers, R. R., and Davenport, S. J.: Review of Literature on the Physiological Effects of Abnormal Temperatures and Humidities, *Pub. Health Rep.* 42: 933 (April 8) 1927; Reprint 1150 United States Treasury Department, Public Health Service, 1927 (extensive bibliography).

UNFAVORABLE REACTION TO ORANGE AND TOMATO JUICES IN INFANT

To the Editor:—There is much in the literature about the use of vitamin D in massive doses in the treatment of arthritis. More recently articles have appeared on the use of vitamin B for the same purpose. I have heard arguments in favor of each. Will you please tell me which is the more useful? I am caring for a boy who has had much trouble with gas from the time he was 6 weeks old. However, at that time his parents had him on a trip, and his trouble was attributed to that for a while. After he was home and settled down, it was discovered that he cried and had pain from gas if he had orange or tomato juice in the morning, but his trouble did not begin until after 6 p. m. and would bother him most of the evening. If he expelled gas, he was relieved. An enema would relieve him. After the elimination of these juices from his diet, he had no trouble. If his diaper is not changed and his skin washed well after every stool, his buttocks became as red as if they had been scalded. He is now 9 months old and cannot take tomatoes without irritation of his buttocks; even ascorbic acid will give the same reaction. He had no form of vitamin C yesterday, but his diaper was not changed immediately after a stool in the night and today his buttocks are greatly irritated. Why is this, and what method can be used to supply vitamin C?
M.D., Nebraska.

ANSWER.—In spite of the fact that a considerable number of papers have been published on the subject of treatment of arthritis with massive doses of vitamin D, it must be recognized that this form of therapy is still in the experimental stage. Negative as well as positive results have been reported. Nothing is known of the physiologic or pharmacologic mechanism by which this vitamin might effect a cure of arthritis. The dose used by

various clinical investigators has varied between 150,000 and 1,000,000 international units of vitamin D a day. Since there is more convincing evidence of the harmful effects from this large dose of the vitamin when used over a considerable period, the method cannot be recommended for regular use until its value has been more firmly established.

While the value of certain factors of the vitamin B complex, particularly thiamine hydrochloride, in the treatment of certain forms of neuritis has been thoroughly proved, evidence of any specific value in arthritis is inadequate at the present time. The most that one could say for it with certainty is that the metabolism of the body as a whole is safeguarded by including adequate amounts of all the vitamins in the daily diet.

It is possible that the infant described is hypersensitive to the proteins in tomato or orange juice, although this is an unusual occurrence. Since all infants require vitamin C, this must be given. If he persists in showing the undesirable effects referred to from taking these juices, it would be necessary to give vitamin C in the form of ascorbic acid. The daily requirement for a baby aged 9 months is somewhere between 25 and 50 mg., an amount which could be dissolved in the formula. Attempts to give orange or tomato juice in gradually increasing amounts should be made as the baby grows older. It is unlikely that these juices are the cause of the intestinal gases referred to. The latter are more likely due to the swallowing of air when the baby is taking his feeding.

ACUTE SUBDELTOID BURSITIS OF PERIARTICULAR FIBROSITIS: PAINFUL SHOULDER

To the Editor:—A woman aged 21, while in Florida, suddenly complained of severe stiffness and pain in the left shoulder. She consulted a physician, who made a roentgenologic study of the shoulder but found nothing wrong. The patient was apparently in excellent health. There was inability to elevate or rotate the shoulder without excruciating pain, and tenderness over the coracoclavicular articulation. There were some pain and tenderness over the lower cervical and lumbar spine on attempted motion and palpation. There was some pain on flexion and extension of the phalangeal articulations in both hands. The blood pressure was 112 systolic and 74 diastolic, the pulse rate was 72; temperature was 98.6 F., respiratory rate 18. The sedimentation test was 7 mm. per hour, red count 4,900,000, hemoglobin 90 per cent, white count 7,500, differential normal, Kahn reaction negative. Cervical smears and gonococcus fixation tests were negative. Urinalysis was negative. A roentgenogram of the teeth was negative and of the hands negative for disease of bone. There was a gingival abscess in the region of the third molar which was opened and drained ten days prior to her visit to Florida. She is an excellent swimmer, giving numerous exhibitions weekly, and is active athletically. She has improved markedly on salicylate medication orally and intravenously, diathermy, and active and passive movements. There is, however, some residual stiffness on arising in the morning. Cold and damp weather also aggravates her condition. Would this be in line with a diagnosis of acute periarticular fibrositis? Should she give up swimming? What is the prognosis; and what further treatment might be instituted?

M.D., Chicago.

ANSWER.—The absence of fever, with negative roentgenograms of the shoulder and normal values for the sedimentation test and the leukocytes, indicates that the condition does not represent infectious arthritis of the shoulder. Most likely the patient had what is generally called "acute subacromial or subdeltoid bursitis" or "humeroscapular periartitis" associated with muscle spasm and inflammation of the adjacent muscles and tendons. Such an event is a common occurrence among athletes, especially among those who use their arms vigorously. Among conductors of orchestras, violinists or baseball pitchers the condition is called "glass arm," "musician's shoulder" and the like. As the patient is an active swimmer and presumably did considerable swimming during her recent vacation, she may easily have injured the left shoulder without being aware of it.

According to Codman (The Shoulder: Rupture of the Supraspinatus Tendon and Other Lesions In or About the Subacromial Bursa, Boston, Thomas Todd Company) and many others the lesion of subdeltoid bursitis generally is not in the bursa but in the tendon of one of the rotators of the arm, especially in the supraspinatus tendon. Minor but repeated injuries to this tendon may produce small tears with microscopic hemorrhage or inflammation, leading to small patches of scar tissue which further weaken the tendon. Later an insignificant injury may precipitate an extremely acute and presumably spontaneous inflammation in the tendon. In some cases the adjacent tissues become involved, and inflammation and muscle spasm affect the articular capsule and surrounding muscles. When this ("acute capsular rheumatism" or "acute periarticular fibrositis") occurs, the patient's pain often forces him to keep the arm fixed with the shoulder and arm sharply adducted. Unless the shoulder is treated properly and placed in proper

abduction, it may become fixed in adduction with permanent partial loss of abductors and posterior rotators.

The role of infection in such cases has not been proved. It would be well, of course, to remove obviously infected foci. The fact that the patient had slight soreness in regions other than the shoulder indicates, perhaps, the presence of mild disseminated fibrositis.

For the time being the patient might use the shoulder within the limits of its proved tolerance, that is, mild active and passive motions of the shoulder are to be desired in conjunction with physical therapy and mild daily manipulations. Vigorous use of the arm, however, such as necessitated by swimming, should be avoided temporarily and not indulged in until ordinary use is essentially painless. Many patients note that, when the acute process subsides, residual soreness can be ameliorated by lying at night with the arm over the head or by sleeping with the head on two pillows and another pillow under the affected arm. Later, perhaps, the patient might temporarily alter her swimming stroke and use one which would traumatize the affected shoulder less than the crawl or other strokes. The arm and shoulder may recover completely, but in many cases there is a tendency for the recurrences of this condition from time to time.

DIABETES AND ALCOHOL

To the Editor:—I would appreciate any information or references you could send me concerning the ingestion of alcohol in diabetic patients: the caloric value, the effect of it on insulin intake and metabolism in these patients.

Leo Keller, M.D., New York.

ANSWER.—The caloric value of alcohol is 7.1 calories per gram as compared with carbohydrate 4.1, protein 4.1 and fat 9.3 calories. Since it contains no carbohydrate, it should have no influence on the need for insulin unless by its use the total caloric value of the diet is in excess, in which case more insulin should be required, in conformation with the original investigation of Allen and Wishart (Alcohol in the Diabetic Diet, *J. Metab. Research* 1:304, 1922). They concluded that "alcohol, which is clearly recognized as not convertible into sugar or acetone in the body, produces a return of glycosuria and other symptoms when added to the diabetic diet in quantities exceeding caloric tolerance." Obviously, if alcohol is used in caloric value to replace carbohydrate, the requirement for insulin should fall.

Alcohol in equivalent dosage should have the same effect on the metabolism of a diabetic as on a normal individual. It is devoid of vitamins. It does not increase or decrease acidosis.

References substantiating these statements about the use of alcohol in diabetes by Newman and Cutting, by Higgins, Peabody and Fitz, by Allen and Wishart, by Leclercq, by Fuller, by Strouse, Soskin and Vidgoff and a discussion of the value of alcohol in diabetes are given in the seventh edition of the Treatment of Diabetes Mellitus by Joslin, Root, White and Marble (Philadelphia, Lea & Febiger, 1940). In Wilder's monograph (Clinical Diabetes Mellitus and Hyperinsulinism, Philadelphia, W. B. Saunders Company, 1940, pp. 159-160) he refers to his original article in Emerson's "Alcohol and Man," 1932.

The whole question of insulin and its effect on the metabolism of alcohol has been reviewed by Thorne M. Carpenter, acting director, Nutrition Laboratory, Carnegie Institution of Washington, and published in a paper entitled The Metabolism of Alcohol: A Review, with many references (*Quart. J. Stud. Alcohol* 1:201 [Sept.] 1940). A concluding sentence is "In general, when insulin is given in large doses, some increase in the rate of disappearance of alcohol takes place, but this hormone is more effective when combined with glucose."

For the use of insulin in alcoholism, apart from diabetes articles have recently appeared by Taylor and Cross (Treatment of Acute Alcoholism with Insulin, *J. Pediat.* 16:341 [Feb.] 1940, Wortis, Bowman and Goldfarb (Use of Insulin in Alcoholism, *M. Clin. North America* 24:671 [May] 1940) and Goldfarb, Bowman and Parker (Glucose and Insulin in Acute Alcoholism, *J. Clin. Investigation* 18:581 [Sept.] 1939).

In Plato's ideal state, the diabetic might profit by the use of alcohol, but in the United States; where so many exist and are trying to earn a living, the diabetic who drink are a menace to themselves and to others, because, although they may not be intoxicated, an alcoholic breath may obscure a hypoglycemic reaction and bring those who have it and at the same time other diabetic persons into disrepute. The diabetic are as liable, and perhaps more so than other persons, to complica-

tions of alcoholism, such as neuritis and amblyopia, the latter condition also having tobacco as an accessory.

Wilder states that "the use of alcohol in diabetes is no longer an important problem. That it has some antidiabetic effect has been shown, but this is too feeble compared with that of insulin to be of practical significance. . . . On the other hand, there is no contraindication in diabetes to the consumption of moderate quantities of alcoholic beverages."

The first sentence of the directions for diabetic patients at the Beth Israel Hospital in Boston is as follows: "Drink no tonics, no wines or other liquors," and we do not recall any hospital which advises its diabetic outpatients to use alcohol in any form.

Joslin tells his patients to leave alcohol alone.

SPASTIC PARAPLEGIA IN FLEXION

To the Editor:—A man aged 36 has been confined to bed for one and one-half years with multiple sclerosis. About three months ago, a flexor contraction of the legs developed which is so intense that the legs are almost completely flexed on the abdomen. Occasionally a paroxysm of flexion will attempt to increase this already aggravated condition. It is impossible to straighten out the legs. The position is painful and makes nursing him a great chore. I read an article in the *Saturday Evening Post* in November 1940 in which was a description of how curare had been used on persons with spasm. Have you any information regarding the use of curare in these extreme contractions? A neurologist suggests chordotomy for the relief of this patient, but if such measures are contemplated I think that even the unknown risk of using a drug like curare might be justifiable. Any suggestions or help will be greatly appreciated.

M.D., Pennsylvania.

ANSWER.—This patient apparently has a clinical condition known as spastic paraplegia in flexion. This always indicates diffuse disease of the spinal cord. He has also spontaneous contractions of the muscles of the legs due to diffuse disease of the spinal cord with almost complete transection. Curare has been used lately for patients suffering from generalized rigidity and increased motion (tremor) due usually to cerebral disease. It also has been used before injections of metrazol for shock therapy in psychosis. It is suggested that the patient be hospitalized and an attempt be made by means of absolute rest and weight pulling on the legs either to diminish or to remove the spasticity. Passive motion, massage and hydrotherapy in the form of whirlpool baths may help. Scopolamine hydrobromide may be given. If after several weeks no improvement takes place, curare may be tried or a section of the posterior roots on both sides in the lower dorsal and upper lumbar regions can be done. Chordotomy per se is done only for the relief of pain. If all the anterior horns in the involved area are sectioned on the two sides then one may have a reduction of the spasticity. This latter operation is not chordotomy and is not recommended. Neither is chordotomy. One must be certain that one is not dealing with a spinal block, which would mean a tumor of the cord. If spinal manometric study has not been done it is recommended that it be done before such procedures are carried out. Patients with spastic paraplegia not due to a tumor of the spinal cord or subacute combined degeneration of the cord offer considerable difficulty in management.

METASTASES FROM CARCINOMA OF ESOPHAGUS

To the Editor:—Will you explain metastasis from the lower part of the esophagus to Virchow's gland in carcinoma of the esophagus? I have a case in which the esophageal lesion showed only hypertrophied rugae in the lower end without any destruction at the surface epithelium. At biopsy this tissue was diagnosed as carcinomatous, and the enlarged gland over the inner third at the left clavicle was said to be metastatic.

E. W. Carpenter, M.D., Greenville, S. C.

ANSWER.—In esophageal carcinoma, metastasis may take place by way of lymph and blood vessels. All the coats of the esophagus have networks of lymph vessels which pass to the lower deep cervical and to the posterior mediastinal lymph nodes. From primary carcinoma in the esophagus secondary growths may arise in the neck, lungs, mediastinum, liver and other places. Even extensive involvement of cervical nodes may take place in small cancers of the esophagus with indefinite or no symptoms. "Virchow's gland" is the lymph node or nodes behind the insertion of the left sternomastoid muscle near the termination of the thoracic duct at the junction of the left subclavian and internal jugular veins. In 1849 and also earlier Virchow pointed out that in carcinoma of the abdomen secondary growths may develop in these nodes, a localization that might be of diagnostic value. The present case illustrates that in cases of enlargement of "Virchow's gland" the possibility of a primary carcinoma of the esophagus should not be neglected.

ACNEFORM ERUPTION IN GASOLINE STATION ATTENDANT

To the Editor:—May I ask your opinion with regard to a patient who works as a gasoline station attendant and is troubled with a cutaneous eruption of a papular acneform nature on his scalp and over the anterior aspect of both thighs. He adds that the papules rarely, if ever, go on to the formation of pustules.

M.D., Massachusetts.

ANSWER.—Papular acneform eruptions on the anterior aspect of the thighs are of frequent occurrence among workers whose trousers become soiled with petroleum and coal tar products, such as oils and greases (Schwartz, Louis, and Tulipan, Louis: *A Textbook of Occupational Diseases of the Skin*, Philadelphia, Lea & Febiger, 1939, pp. 190 and 616). Daily change to clean underclothes and work clothes, together with cleansing baths after work will prevent the occurrence of this condition. While no cases of such a papular acneform eruption of the scalp caused by petroleum or coal tar products have been reported, it is a possibility that grease on the scalp may produce this condition. However, it seems more likely that the cutaneous eruption on the scalp is due to some other cause.

HIGH FAT DIET IN CHRONIC CHOLECYSTITIS

To the Editor:—A patient with chronic cholecystitis obtains relief from dairy and frequent ingestion of eggs and cream. Would this be contraindicated, having in mind the danger of gallstone formation? Cholecystography is negative for calculi. The blood cholesterol is normal.

M.D., New York.

ANSWER.—There is no completely satisfactory clinical or experimental evidence to indicate that a high fat, high cholesterol intake of itself will increase the amount of cholesterol in bile or favor the development of gallstones. Such a diet may be of more etiologic significance if infection or biliary stasis is present. The patient in question may have some functional type of biliary stasis which produces distress; under such circumstances the diet mentioned, which should produce a maximal degree of motor activity, is desirable. High fat intakes and the use of bile acids and antispasmodics have been recommended even in the presence of gallstones (Mock, H. E.; Brown, C. F. G., and Dolkart, R. E.: *The Conservative Treatment of Gallbladder Disease*, *Surg., Gynec. & Obst.* 66:79 [Jan.] 1938.) and seem to produce symptomatic improvement in many cases.

ACCELERATED REACTION TO SMALLPOX VACCINATION

To the Editor:—In June 1940 I vaccinated a boy aged 8 years who had previously been vaccinated twice with reported failure. When I vaccinated him, the typical red oreo, vesicle and brownish scab developed. It was, however, on accelerated reaction, being completed in about seven or eight days, and there was little foveation or puckering or scar through the epidermis down to the corium. I gave him a certificate of vaccination. I have just learned that the school physician refused to honor the certificate because he says there is insufficient scar. (I might also add that this vaccination was done under aseptic conditions with an approved fresh virus.) It is my opinion that, if one has a high immunity, revaccination will often give an accelerated reaction and leave little or no scar. Is this assumption correct? Do you believe this boy should be vaccinated again and again until he gets a sizeable scar? If my knowledge of immunity is correct, he will get less and less of a scar (unless there is secondary infection) when he is revaccinated time and again.

M.D., Pennsylvania.

ANSWER.—The accelerated reaction described is valid evidence of protection against smallpox. There is no reason whatever for further vaccinations at this time or for refusal to honor the certificate of successful vaccination.

BLOOD TYPE DOES NOT CHANGE

To the Editor:—I should like to add a few remarks to the answer to the query "Blood Type Does Not Change" in the *Journal* of June 28, page 2893. The query referred to two questions; (a) the apparent change in the blood group from O to A and (b) the absence of a reaction following the transfusion of blood at group A to a recipient whose blood was not stated. The first question was answered adequately. One could add to the answer to the second question two remarks. The low titer of isoagglutinins in the recipient may explain the absence of a reaction when incompatible blood is transfused. Such low titers occur not infrequently. They are especially common in the aged and in patients with chronic leukemia. The effect at a low titer at isoagglutinins in the recipient would be especially noticeable in a case of a donor of subgroup A₂, which is characterized by a low agglutinability. Another consideration in this case has to do with the absence in the query at a statement regarding the recipient's blood group. The donor was originally thought to belong to group O, which group is used for recipients of all blood groups. If the recipient in this case was of group A, the then absence of a reaction would be expected.

Israel Davidsohn, M.D., Chicago.

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THE USE OF SULFANILAMIDE AND SULFATHIAZOLE IN ORTHO- PEDIC SURGERY

CHAIRMAN'S ADDRESS

J. ALBERT KEY, M.D.
ST. LOUIS

The discovery that sulfanilamide in low concentrations which are tolerated in the animal body inhibits the growth of certain pathogenic bacteria has led to the use of this drug in the treatment of a wide variety of conditions. It has also stimulated experimental studies of the effects of the drug on various pathogenic organisms and on the animal body. As sulfanilamide is moderately toxic and affects only certain bacteria, a large number of related compounds have been synthesized and are being studied. The most widely used are sulfanilamide, sulfapyridine and sulfathiazole. It is possible that sulfadiazine may be added to this list (Feinstone and others,¹ Long²).

Since sulfapyridine is particularly effective against the pneumococcus and is not more active against pyogenic organisms than are the other two drugs mentioned, orthopedic surgeons are not particularly interested in it.

In this paper I shall consider especially the use of sulfanilamide and sulfathiazole in orthopedic surgery. It is now generally recognized not only that sulfanilamide is a valuable drug when administered by mouth or through other routes for its bacteriostatic effect on bacteria which may be present in the animal body but also that it is useful when implanted locally in contaminated or infected wounds. The same fact is true of sulfathiazole, though this is not yet generally recognized. Sulfanilamide is effective against hemolytic streptococci in low concentrations but has relatively little effect on staphylococci or *Clostridium welchii* unless the drug is present in a very high concentration. Sulfathiazole is as effective against streptococci as is sulfanilamide and is more effective against staphylococci, *Clostridium welchii* and *Clostridium septicum* but is not effective against *Clostridium oedematiens* (Hawking³). However, a good deal more data are needed on its experimental and clinical use in staphylococcal infections and gas gangrene before sulfathiazole can

be properly evaluated. It is much less soluble than sulfanilamide and consequently may be expected to remain in the wound longer after local implantation. On the other hand, the concentration of sulfathiazole in the fluid in the wound will be much less than will that of sulfanilamide under the same conditions. More work is needed on the effect of saturated solutions of these drugs on pathogenic bacteria.

The local use of these drugs has for its rationale the fact that the fluid which is present in the wound becomes temporarily saturated with the drug and that a local concentration can be obtained which is many times higher than that present in the blood after full therapeutic doses. Since the effectiveness of the drug varies directly with the concentration, the advantage of a high local concentration in the area where the bacteria are is obvious.

It has been shown that a saturated solution of sulfanilamide or the implantation of the powder in a wound does not seriously damage tissues or seriously interfere with wound healing, and experiments in progress indicate that the same statement is true of sulfathiazole (Key and others⁴).

It has also been demonstrated that sulfanilamide can be used locally in suitable amounts in operative wounds without danger of serious toxic effects (Key and Burford⁵) and I believe that I now have had sufficient experience with sulfathiazole to indicate that the same statement is true of this drug.

It is further to be noted that these drugs are dissolved independently by the solute. That is, if one drug is added to a saturated solution of the other drug, it too will be dissolved in the usual amount; thus the fluid may be saturated with the two drugs at the same time. I believe that this is important and I am now using mixtures of sulfanilamide and sulfathiazole powder in both clean and infected wounds. The mixtures are tolerated by the tissues and do not seem to interfere with the healing of the wounds, but it is too early yet to state whether or not they are more effective bacteriostatic agents than are the single drugs.

CLINICAL USE

In considering the clinical use of these drugs in orthopedic surgery it seems advisable to divide the patients into the following groups: patients with (1) clean operative wounds, (2) contaminated traumatic wounds, (3) acute pyogenic infections and (4) chronic pyogenic infections.

1. *Clean Operative Wounds.*—In reports on the local implantation of sulfonamides in experimental animals it was stated that sulfanilamide was being used

From the Department of Surgery of the Washington University School of Medicine.

Read before the Section on Orthopedic Surgery at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

1. Feinstone, W. H.; Williams, R. D.; Wolff, R. T.; Huntington, Evelyn, and Crossley, M. L.: The Toxicity, Absorption and Chemotherapeutic Activity of 2-Sulfanilamidopyrimidine (Sulfadiazine), *Bull. Johns Hopkins Hosp.* 67: 427 (Dec.) 1940.

2. Long, P. H.: Sulfadiazine: The 2-Sulfanilamidopyrimidine Analogue of Sulfanilamide, *J. A. M. A.* 116: 2399 (May 24) 1941.

3. Hawking, Frank: Prevention of Gas Gangrene Infections in Experimental Wounds by Local Application of Sulfonamide Compounds and by Sera, *Brit. M. J.* 1: 263 (Feb. 22) 1941.

4. Key, J. A.; Frankel, C. J., and Burford, T. H.: The Local Use of Sulfanilamide in Various Tissues, *J. Bone & Joint Surg.* 22: 952 (Oct.) 1940. Key, J. A., and Frankel, C. J.: The Local Use of Sulfanilamide, Sulfapyridine and Sulfamethylthiazole, *Ann. Surg.* 113: 284 (Feb.) 1941.

5. Key, J. A., and Burford, T. H.: The Prophylactic Implantation of Sulfanilamide in Clean Operative Wounds for the Reduction of Post-operative Infection, to be published.

locally and not only in contaminated and infected wounds but also in clean operative wounds.⁴

The routine use of the sterile dry powder of one of the sulfonamide drugs in all clean operative wounds during the past two years has confirmed the value of the procedure and has led me to believe that for orthopedic surgeons this affords the widest field of usefulness for these preparations. During this period I have used sulfanilamide in 150 cases,⁵ sulfathiazole (in sterile ampules supplied by the Abbott Laboratories) in 70, and a mixture of sulfathiazole and of sulfanilamide (supplied by Hynson, Westcott and Dunning) in 23. In none of these has a postoperative infection occurred. This series represents a good many more wounds than patients, because many of the patients had two or more separate incisions.

Under the best of operative conditions a certain percentage of postoperative infections is unavoidable. Since this is true and since one is not able to determine beforehand which wounds will become infected, it must be admitted that every so-called clean operative wound is potentially an infected wound. If, in addition to using every precaution to prevent operative infection, one can place within the wound a sterile substance which will prevent the growth of any casual bacteria which may have gotten into the wound through an accidental break in operative technic or from the surrounding air and at the same time know that this substance will not seriously injure the patient or interfere with the healing of the wound, it seems reasonable to use this substance.

The experience with 243 cases demonstrates that sterile sulfanilamide and sulfathiazole are suitable substances for implantation in clean operative wounds and that their use in this manner tends to lessen the incidence of postoperative infections. In this series there has not been any appreciable interference with the healing of the wounds. In a few of the early cases in which too much of the drug was placed in small wounds there was a tendency to the accumulation of an excess amount of serum in the wound and in 2 cases this serum was expressed after the sutures were removed. In neither instance, however, was there any evidence of infection, and the wounds healed by primary intention except for the small area left open after the expression of the serum, and here the healing was delayed for a few days. During the past year and a half there have been no such instances, as during this time the amount of the drug used has been relatively small—rarely over 5 Gm. in one operative wound and in many instances only 1 or 2 Gm. or even less in small wounds, the object being not to place enough of the powder in the wound to interfere with the coaptation of the wound surfaces or to permit the formation of aggregates in the depth of the wound. One patient developed a bed sore which interfered with the healing of a spinal fusion wound, but this was due to poor postoperative care and not to the use of the drug.

The next question that arises is whether or not the local implantation of the drug tends to cause toxic symptoms in the patients. In certain instances there was an unexplained elevation of temperature after the operation. This occurred in 7 cases of the sulfanilamide series. It has seemed to be somewhat more frequent with the use of sulfathiazole than with sulfanilamide, but the data on this series are not yet complete. In no instance did the rise of temperature last more than a few days, nor did it do any harm other than cause anxiety to the surgeon. There was no other evidence of toxicity

in cases in which the drug has been used locally in clean operative wounds. Three patients had a rash after the operation, but 2 of these were patients with chronic osteomyelitis who were also taking the drug by mouth. The third was a small child who had a relatively large amount of sulfanilamide implanted in a tuberculous cavity in the ilium. It is thus evident that the drug can be used locally in clean operative wounds with safety.

The rationale of the procedure is that by the use of the drug in this manner a high concentration—that is, a saturated solution—of the drug is brought into direct contact with any organisms which may be present in the wound. This concentration of the drug in the wound lasts approximately forty-eight hours—that is, until the drug is absorbed and excreted. It is probable that the sulfathiazole lasts longer. The time during which the drug remains in the wound will vary directly with the amount implanted and indirectly with the blood supply of the area and with the surface exposed for absorption. In tissues well supplied with blood the absorption is more rapid than it is in areas where the blood supply is scanty. It can be placed in joints and other body cavities and apparently does no harm to the lining of these cavities. However, it is to be noted that in large cavities, such as the peritoneum or the pleura, an extensive surface is exposed to the drug and consequently the absorption may be unusually rapid and cause high concentrations of the drug in the blood. For this reason it seems advisable to use a mixture of sulfanilamide and the less soluble sulfathiazole in these cavities.

In addition to placing the powder in the wound before it is sutured, a small amount is sprinkled along the suture line after the skin is closed. The dressing is then put on and the drug will tend to saturate the blood or serum which drains from the wound and thus prevent the development of stitch abscesses. This is especially true if the wound is encased in a plaster of paris cast in which it is undesirable to change the dressing for some time.

It is to be emphasized that the use of the drug in the wound for the prevention of infection does not warrant any letting down in surgical technic, because it is not infallible and I know of 4 instances in which postoperative infections have occurred after sulfanilamide powder has been placed in so-called clean wounds.

2. Contaminated Traumatic Wounds.—These are lacerations or compound fractures which are treated before sufficient time has elapsed after the injury to permit the development of an actual infection in the tissues. In civilian life it is usually stated that a wound is not considered infected until from six to twelve hours after the injury, the time varying inversely with the amount of damage to the tissues; that is, in a wound with relatively little damage to the tissues a greater amount of time will elapse before actual infection develops, other things being equal.

There is considerable difference of opinion as to whether or not such wounds should be sutured. It has been my custom to close such wounds by primary suture after a careful débridement and expect primary healing. If I was not satisfied that I had done an adequate débridement and removed all devitalized tissue and foreign material in the wound, it was packed open with petrolatum gauze. This method has been used for the last twenty years and most such wounds have been sutured immediately with satisfactory results. By the use of sulfanilamide or sulfathiazole powder in the wound, or a mixture of the two, a wound can be sutured

with more assurance than could the same wound without the use of the powder (Key⁶). In other words, the powder will tend to keep down the infection until the clearing mechanism of the body has had a chance to eliminate the bacteria. That most compound fractures in civilian life can be debrided and sutured primarily with satisfactory results if sulfanilamide powder is implanted in the wound is amply proved by the series of such cases reported by Jensen, Johnsrud and Nelson⁷ and by Jackson.⁸

If one believes that these wounds should not be sutured after débridement but should be left open and the wound packed with petrolatum gauze or with other material, in order to permit drainage, then the probably mild infection which will eventually develop on the surface of the wound will be minimized by sprinkling the powder over the surface of the wound before the petrolatum gauze or other packing material is inserted.

The use of sulfanilamide or sulfathiazole in the wound does not permit the letting down of any of the standards for a complete débridement of the wound, nor does it eliminate the necessity for adequate reduction of the fracture and immobilization of the part after the wound has been sutured or after the wound has been packed open. It does, however, permit the use of internal fixation in the treatment of compound fractures.

In military surgery, which is occupying such a prominent place in our thoughts, the use of sulfanilamide or sulfathiazole powder or a mixture of the two will lessen the incidence of infection after wounds have been debrided. However, contaminated war wounds should not be sutured, and especially is this true in a war of movement where the men are treated in casualty clearing stations or other hospitals and are then moved on after a few hours or after a longer interval.

When a surgeon debrides and sutures a contaminated wound he should assume the obligation of watching this patient until the danger of infection has passed. For this reason it is not wise to advocate débridement and immediate closure of war wounds in military surgery. Many of these will have to be left open, not because they could not have been sutured under favorable conditions but because it is not possible to keep the patients in the hospital and under the care of the operating surgeon until sufficient time has elapsed so that the danger of infection is no longer present. It is further to be noted that the transportation of such patients either in casts or in splints causes a variable amount of movement of the part and exposure of the patient and is accompanied by some pain. Movement of the part lowers the local resistance, and pain and exposure lower the general resistance. Consequently, transportation of a recently operated compound fracture tends to favor the development of an infection in the wound.

In civilian life the movement of the part, pain and exposure can be reduced to a minimum, but under war conditions, and especially those of total war, military necessity may cause the wounded who have recently been operated on to be transported when and if the opportunity presents itself and by whatever means are available. Consequently, wounds in war should be debrided, sprinkled liberally with sulfanilamide or sulfathiazole or, preferably, a mixture of the two, packed open with petrolatum or plain gauze and immobilized in

a cast or splint which will maintain the reduction effected during the operation.

The question immediately arises as to whether or not these men should also be given sulfanilamide or sulfathiazole by mouth. Ordinarily in civilian practice I do not give sulfanilamide or sulfathiazole by mouth to a patient with a recently debrided and sutured contaminated wound. It is believed that adequate débridement plus local implantation of the drug are sufficient and this has been my experience in the past. On the other hand, in certain cases in which a little more time than is considered safe has elapsed or I am not quite sure of the efficiency of the débridement, in addition to placing the drug in the wound I give the patient full doses of sulfathiazole by mouth before the operation and as soon as he is able to take it after the operation (usually 2 Gm. is given before the operation and 1 Gm. every four hours for the first two days after the operation). If there is no evidence of infection at the end of two days the drug is stopped entirely, or it may be tapered off. Fluids are forced while sulfathiazole is being given in order to prevent damage to the kidneys. This plan seems suitable for war wounds, in which the danger of infection is greater than in civil life.

3. Acute Pyogenic Infection.—These patients fall into two groups: (1) those with contaminated wounds in which sufficient time has elapsed to permit the development of infection and (2) acute hematogenous pyogenic infections, such as acute osteomyelitis and acute arthritis.

In the first group the wound, usually a compound fracture, is open and is draining but the drainage is inadequate. There is usually a mixed infection, and the bacteria are not all on the surface of the wound but have grown into the tissues, and the organisms of gas gangrene may be present. These patients are ill with a systemic infection and need the drug which will most effectively combat a mixed infection. This is sulfathiazole, and it should be given by mouth in full doses or, if necessary, as the sodium salt intramuscularly in strong solutions or intravenously in dilute solutions.

In addition to the general administration of the drug, the wound should be adequately drained, foreign bodies should be removed and obviously devitalized tissue should be excised. All acutely infected wounds should be left wide open. In gas gangrene, involved muscle should be excised and the patient should be given large doses of the polyvalent serum.

After the operation is completed and the toilet of the wound is made, the surface of the wound and its depths should be sprinkled liberally with sulfathiazole or with a mixture of sulfathiazole and sulfanilamide, the amount of the drug being considerably more than is used in wounds which are being closed. This is for two reasons. The first is that absorption of the drug will be less and the second is that with an established infection it is probable that large numbers of bacteria will remain in the tissues even after an adequate débridement.

Finally, the wound should be immobilized and the patient should receive supportive treatment, including a transfusion of blood or plasma if indicated, and the sulfathiazole should be continued by mouth until evidence of general infection has subsided.

In hematogenous pyogenic osteomyelitis or pyogenic arthritis the problem is somewhat similar, except that the focus of the infection has not been drained. At the present time there is considerable difference of opinion as to whether or not this local focus should be attacked

6. Key, J. A.: Treatment of Compound Fractures, Nebraska M. J. 24: 367 (Oct.) 1939.

7. Jensen, N. K.; Johnsrud, L. W., and Nelson, M. C.: Local Implantation of Sulfanilamide in Compound Fractures, Surgery 6: 1 (July) 1939.

8. Jackson, Ruth: A Comparative Study of the Treatment of Compound Fractures, South. M. J. 34: 319 (March) 1941.

surgically. Many believe that acute hematogenous osteomyelitis is a general disease or septicemia of which the local focus in the bone is but one manifestation, and that the patient should be treated medically rather than surgically. I do not concur in this belief. It is my opinion that the local infection in the bone should be drained as soon as it is safe to do so; that is, as soon as the patient is in condition to stand the operation.⁹

The chemotherapeutic agents at our command cannot be relied on to sterilize an abscess cavity in the bone when they are administered by mouth. It is true that when sulfanilamide or sulfathiazole is given by mouth a concentration is eventually obtained in the fluid of the abscess cavity which approaches that present in the blood. In my experience the concentration obtained in the pus has been approximately 50 per cent of that present in the blood. However, this concentration is not sufficient to kill staphylococci.

There is no doubt that in certain cases of acute pyogenic osteomyelitis, if large doses of sulfathiazole are given, the disease in the bone will subside and the bone will eventually heal. How frequent these cases are, I do not know. I have seen 1. On the other hand, I have seen patients who developed metastatic foci while they were receiving full doses of sulfathiazole and who eventually became osteomyelitic derelicts as a result of widespread destruction of bones and joints. Other patients have died without operation. I have also seen patients with mild pyogenic infections in bone get well without surgical intervention or chemotherapy.

Sulfathiazole rather than sulfanilamide should be used in every case of acute pyogenic osteomyelitis. It should be given in full doses by mouth if possible or intramuscularly or intravenously if necessary. As soon as the patient is in condition for the operation, the focus in the bone should be drained. No attempt should be made to remove the entire area of the disease. At the operation sulfathiazole powder or a mixture of sulfanilamide and sulfathiazole should be implanted in the wound in liberal amounts. The wound should then be packed loosely with petrolatum gauze and the extremity immobilized in a plaster cast. Supportive treatment of the patient should be continued and the patient should be given full doses of sulfathiazole by mouth until his temperature has subsided. At the same time fluids should be forced. For a very toxic patient the staphylococcus antitoxin should be used if it is available. The drug will exert a favorable influence on the septicemia, lower the mortality, tend to decrease the amount of destruction of bone and decrease the number of metastatic foci which tend to develop in this disease.

The same is true of acute pyogenic arthritis. The joint should be opened, washed out with physiologic solution of sodium chloride, a liberal amount of sulfathiazole powder should be implanted in the joint cavity and, as a rule, the joint should be left open. In certain relatively mild infections I have closed the joint and immobilized it, and the wounds have stayed healed and a useful joint has resulted.

4. *Chronic Pyogenic Infections.*—These include chronic osteomyelitis and chronic infections of soft tissues, either deep infections or surface infections. As staphylococci are usually present, sulfathiazole is the drug of choice, although sulfanilamide powder in concentrated form will tend to lessen the amount of drainage and decrease the activity of the infection in the

wound. Either drug is useful as a dusting powder for chronic surface infections and tends to lessen the amount of secretion in chronic osteomyelitis. But they cannot be expected to cure chronic infection in bone. The same fact is true of sulfathiazole by mouth in chronic osteomyelitis. In certain instances in which the condition is nonoperable, as in extensive involvement of the shaft of the femur, I have given patients the drug by mouth over a considerable period and they have felt better and the discharge from the wound has been less. None of these infections, in my experience, have healed and remained healed. The chief use of the drug in chronic osteomyelitis is that recently pointed out by Dickson and Diveley.¹⁰ They have shown that chronic osteomyelitis can be treated surgically and the wound can then be sprinkled with sulfathiazole powder and closed.

I have followed this procedure in 17 cases and in none of these have there been any untoward results. Fourteen healed by primary intention. In the 3 others there was a definite reason for the failure of primary healing. One of these was an extensive disease of the tibia in which, after sequestrectomy and saucerization, it was not possible to close the wound completely. It eventually healed by granulation. Another tibia was operated on eight weeks after the acute focus in the bone had been drained. This was cleaned out thoroughly and the wound was almost closed. This wound is now healed. In the third case, in which operation was performed four weeks after the onset, a large abscess was drained, the femur was opened and extensive necrosis was present in the lower end of the shaft. The drug was given by mouth as well as locally, and the wound was packed open. There had been extensive destruction of bone, and this child may require a second operation for the removal of a sequestrum.

The operation is most successful in chronic osteomyelitis in which sinuses can be excised, all dead bone can be removed and the walls of the wound can be closed. For one or two days before the operation the patient is given full doses of sulfathiazole by mouth—that is, 1 Gm. every four or six hours—and this is continued after the operation until danger of a flare-up of the infection is past, usually only for three or four days. The dose is then gradually tapered off.

In operating in such cases I have not used any deep sutures but have closed only the skin and fascia with large through and through sutures of silkworm gut. After the operation the limb is immobilized in a plaster of paris cast without drainage. When the drug is being given by mouth toxic manifestations are more apt to occur, and in 2 of the 17 cases a rash developed after the operation.

CONCLUSIONS

1. The implantation of sterile sulfanilamide or sulfathiazole powder in clean operative wounds is a safe procedure and will decrease the incidence of postoperative infections.

2. The local use of the drug will lessen the incidence and severity of infection in contaminated wounds whether these are sutured or left open.

3. Acute pyogenic infections should be drained adequately, and sulfathiazole should be used locally and given by mouth in full doses.

4. Chronic pyogenic foci in bone and soft tissues can be excised and the wound closed if sulfathiazole is given in full doses by mouth and implanted in the wound before it is sutured.

9. Key, J. A.: The Early Operative Treatment of Acute Hematogenous Osteomyelitis, *Surgery* 9: 657 (May) 1941.

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ROCKY MOUNTAIN SPOTTED FEVER

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Rocky Mountain spotted fever is an acute infectious disease caused by the virus-like organism *Dermacentor rickettsii*, which is transmitted to human beings by an infected tick. The infection is characterized clinically by an acute onset with chills and fever, severe headache, restlessness, delirium and a characteristic hemorrhagic eruption of the skin. The histopathologic picture of the early stage of this cutaneous manifestation is a proliferation of the endothelial lining of the small blood vessels followed by necrosis of the endothelium and of the smooth muscle of the media. Later, typical manifestations of phlebitis, thrombosis and gangrene may be present.

DISTRIBUTION AND CARRIERS

Rocky Mountain spotted fever, recognized for half a century in the Rocky Mountain states, can no longer be considered as limited in distribution to the Rocky Mountain states area because the *Public Health Reports*¹ show a total of 2,190 cases occurring in thirty-seven of the forty-eight states during the five year period from 1933 to 1937 inclusive, 1,435 cases, or 65.5 per cent, occurring in the Mountain and Pacific states, and 601 cases, or 27.4 per cent, occurring in the South Atlantic group. These two areas accounted for 93 per cent of the total number of reported cases. The occurrence of the infection is seasonal and the human infections occur during the tick season. The western type, of which the carrier is the wood tick, occurs in the spring, with the majority of cases in the months of April and May. The eastern type, of which the carrier is the dog tick or the rabbit tick, has a longer season running through spring, summer and autumn.

Wilson and Chowning² in 1902 suggested that Rocky Mountain spotted fever was transmitted by the wood tick *Dermacentor andersoni* and that an animal reservoir existed somewhere in nature. Ricketts³ in 1906 demonstrated the presence of infected wood ticks in nature and the hereditary passage of the infectious organism from one generation of ticks to the next. McColla⁴ in 1908 published the results of an experiment in which, three years previously, he removed a wood tick from a patient showing early symptoms of Rocky Mountain spotted fever and produced the disease in two volunteers by allowing this tick to feed on them. Maver⁵ in 1911 suggested that the American dog tick *Dermacentor variabilis* could transmit Rocky Mountain spotted fever, and this observation was proved in 1931 by the work of Rumreich, Dyer and Badger.⁶ From the result of field observations in 1917, Badger demonstrated in 1923 that the rabbit tick *Haemaphysalis leporis palustris* Pack can

be a carrier. Parker⁷ has found five other species of ticks in the United States that under laboratory conditions are potential carriers of Rocky Mountain spotted fever.

CAUSATIVE ORGANISM

Human infections with Rocky Mountain spotted fever are acquired only through the medium of infected ticks, usually by tick bites. There is no characteristic lesion at the site of attachment of the tick, and not infrequently the site of the bite cannot be found. If a lesion not due to irritation is present it is likely the result of secondary infection or some tick-borne agent other than the spotted fever rickettsia. Occasionally there is enlargement of the regional lymph nodes. Some few human infections are probably contracted through the skin without a tick bite by contamination with tissues of infected ticks resulting from picking ticks from domestic animals with the bare hands.

The causative agent of Rocky Mountain spotted fever is a gram-negative staining bacillus, *Dermacentor rickettsii*. The known characteristics of this micro-organism seem to indicate that it is intermediate between a bacterium and a filtrable virus, that it can be cultivated only in vivo and that it can be demonstrated in stained sections of infected tissues. Further research work is necessary to establish the method of transfer of this infectious agent from one generation of tick to another.

The terms "eastern type" and "western type" of Rocky Mountain spotted fever are frequently used in the literature. To some persons, at least, this differentiation has seemed to rest mainly on the false assumption that the disease in the West is consistently characterized by a higher case fatality rate than in the East. Evidence that the eastern type is not always a mild infection is clearly demonstrated by the considerable number of reported cases in which the diagnosis has been established post mortem. The differentiation between the two types is perhaps more accurately defined by assuming that the western type occurs in areas which are the habitat of the wood tick while the eastern type occurs outside of these areas, the infection being carried by a different species of tick.

Parker has shown that the virus of any individual Rocky Mountain wood tick of a local tick population may range in virulence from a nonimmunizing non-demonstrable phase to that of the prevailing maximum local virulence.

In a fasting, hibernating Rocky Mountain wood tick or one just emerging from hibernation, the virus is usually either completely inactive or in a phase which causes inapparent infections when injected into laboratory animals. However, if such a tick is incubated or is allowed to ingest blood, the virus becomes "reactivated" and soon reaches its maximum potential virulence.

The variation of the virus together with a demonstrable difference in individual resistance or susceptibility to the infection is a definite factor in the production of the three differentiated clinical types of Rocky Mountain spotted fever: the mild type, the severe type and the fulminating type.

CASES OF MILD TYPE

The group of cases of mild type, including a far greater number of infections than the other two groups combined, is composed of the cases ranging in severity from those presenting symptoms and clinical signs sufficient only for a positive diagnosis to those in which

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there is moderate sickness and toxicity, with the temperature remaining under 102.5 F. and the pulse rate not exceeding 90 a minute.

The incubation period of the cases of mild involvement is from three to fourteen days. There is usually a prodromal period of two or three days characterized by loss of appetite, irritability, malaise and chilly sensations.

The typical cases start with a chill and a rather slowly rising temperature reaching its peak on the fifth day. The complaints are of a severe basal and frontal headache and pains in the muscles, bones and joints. Restlessness and insomnia are usually well defined, and some degree of cyanosis is present.

The characteristic cutaneous lesions appear usually on the fourth to the sixth day, accompanied by a decrease in the severity of the muscular pains. The eruption consists of bright red, widely scattered maculopapular lesions which at first will disappear on pressure. Later they become darker, enlarge by peripheral extension and will not disappear on pressure. After three or four days there is usually another "crop" of lesions and not infrequently as many as three distinct "crops" are seen in a case of mild involvement. The cutaneous lesions then undergo the changes seen in extravasation of blood into cutaneous tissue, with the pigmentation remaining in these areas for several weeks or even months.

The temperature after reaching its peak usually remains rather constant until the beginning of the third week, at which time it falls by lysis, which usually requires a period of six to eight days in the western type and from three to four days in the eastern type of infection.

CASES OF THE SEVERE TYPE

In cases of severe involvement the incubation period is from two to five days and the onset is sudden, being ushered in with a hard chill and presenting some combination of the following symptoms: malaise, sweating, severe backache, frontal and occipital headache, injection of the conjunctivas, sensitivity of the eyes to pressure, photophobia, pain in the muscles, bones and joints, nosebleed, nausea, aphasia and lack of muscular coordination. The severity of the symptoms increases rapidly and the face soon assumes a dusky flush.

The temperature rises steadily until by the third day it has reached 103 or 104 F., which ordinarily is the peak except for fatal cases, in which not uncommonly terminal hyperpyrexia of 106 F. or higher develop. The elevation of temperature is accompanied by an increase in pulse rate from 110 to 140 a minute. The mind may remain unusually clear, but more often there is a stupor from which the patient is easily aroused.

The cutaneous rash usually appears on the second or third day as a bright red generalized macular eruption on areas including the palms of the hands, the soles of the feet, the scalp and quite frequently the mucous membrane of the mouth and throat. These macules soon become a darker hue and will not disappear on pressure. They enlarge by peripheral extension and coalesce to form confluent hemorrhagic blotches which for several months after recovery remain as pigmented areas. The course of the febrile period is exceedingly stormy and the period of convalescence for the survivors is usually from several to many months, and even then a considerable percentage fail to regain a condition comparable to their previous normal state of health. The acute symptoms ordinarily last for three weeks or longer, with the temperature falling by lysis and requiring a period of a week or ten days to regain a normal level.

CASES OF THE FULMINATING TYPE

Cases of the fulminating type start suddenly with a chill followed by a rapid rise in temperature and an increase in the pulse rate. The symptoms are more severe, especially those of the nervous system, than in the severe type with more evidence of a profound toxicity. Incontinence of urine and feces, convulsions, muscular tremors, muscular rigidity and opisthotonos are commonly seen. The cutaneous manifestation, which at first is composed of closely spaced macular lesions, spreads rapidly and becomes a confluent hemorrhagic eruption with necrosis and sloughing, the parts commonly affected being the scrotum, prepuce, vulva, soft palate and dependent portions of the body and buttocks. The course of the disease in these cases is exceedingly rapid, with the patient lapsing into a profound coma and the temperature continuing to rise to a high level, with death occurring as the result of an overwhelming toxicity accompanying an extremely virulent infection.

MANIFESTATIONS AND COMPLICATIONS

Common clinical signs, in addition to those which have been mentioned, are enlargement of the spleen, enlargement of the liver and jaundice. Laboratory examinations show a concentration of the urine, commonly with albuminuria. The white blood cell count does not usually exceed 15,000 but may be 30,000. The red blood cell count may be below or slightly above normal. The spinal fluid is normal.

Fatalities rarely occur in the cases of mild involvement, are fairly common in the cases of severe involvement and are the usual termination in cases of the fulminating type of Rocky Mountain spotted fever. Death, however, may occur in any of the types from complications or from concurrent conditions. The most common complications are pneumonia, phlebitis, hiccup, hemorrhage from the nose, intestine or kidneys, with iritis, acute nephritis and hemiplegia appearing less frequently. The concurrent conditions, due directly or indirectly to ticks, that may occur are streptococcal septicemia, tularemia and tick paralysis.

The *Public Health Reports* showed 233 deaths among 1,203 cases occurring in the Western states from 1933 to 1936 inclusive, which is a fatality rate of 19.4 deaths per hundred cases. The South Atlantic states reported during the same period 86 deaths among 469 cases, or a case fatality rate of 18.1 deaths per hundred cases.

DIAGNOSIS

The clinical diagnosis of Rocky Mountain spotted fever is often difficult even for those familiar with the disease. Particularly is this true of the very mild attacks and of the rapidly fatal attacks of the fulminating type. Certain cases of toxoplasmosis have been reported to exhibit cutaneous manifestations closely resembling the cutaneous eruption of Rocky Mountain spotted fever. Another problem in diagnosis is presented when Rocky Mountain spotted fever occurs in an area in which typhus fever is endemic. For these reasons, if at all feasible, a clinical diagnosis of Rocky Mountain spotted fever should be confirmed by one or more laboratory tests. The three tests ordinarily used are the infection test, the Weil-Felix reaction and the protection or virus-neutralization tests. However, a description of these tests is not within the scope of this paper. In the cases with a fatal outcome additional confirmation of clinical diagnosis can be obtained by demonstration of the characteristic pathologic changes in diseased tissue.

TREATMENT

At present no drug has been found that exerts any specificity toward the infectious organism of Rocky Mountain spotted fever. The best treatment is symptomatic and supportive. Conservative treatment seems to be the most successful. Early hospitalization and adequate nursing care are considered the most important items to spare the patient every possible exertion. Elimination should be promoted by frequent enemas, and the fever should be reduced by sponge baths and alcohol rubs. Dehydration should be prevented by forcing liquids orally, rectally, subcutaneously or intravenously. Codeine is the drug of choice for restlessness and insomnia. Convalescent serum and transfusions from immune or nonimmune persons have shown no definite specificity in this infection.

PROPHYLAXIS

The United States Public Health Service vaccine for Rocky Mountain spotted fever is prepared at the Rocky Mountain Laboratory of the National Institute of Health at Hamilton, Mont.

The vaccine is given in two doses of 2 cc. each at an interval of five days, either subcutaneously or intramuscularly. The known data indicate that the vaccine fully protects the majority of persons against the less virulent strains but that the average person is only partially protected against the highly fatal type of Rocky Mountain spotted fever, and that the maximum degree of protection conferred is retained for less than one year.

REPORT OF CASES

CASE 1.—A white woman aged 23, admitted to Colorado General Hospital on May 31, 1940, complained of chills, fever and headache for one week and rash for three days. On May 19 the patient discovered a tick attached to the skin of her abdomen. The tick was removed the following day. May 24 the patient had a severe chill, followed by an elevation of temperature to 105.8 F.; since that time she had had continuous fever, the minimum having been 100 F. On May 28 a maculopapular rash appeared, first on her arms and legs, with subsequent crops involving the trunk, palms of the hands and soles of the feet. Past illnesses consisted of cystitis at 5 years, scarlet fever at 12 years and measles at 10 years. She had had a fever of undetermined origin in 1936 and staphylococcal septicemia in 1937; tonsillectomy had been performed at the age of 12 years. The remainder of the history was inconsequential. Examination on admission revealed a temperature of 102.4 F., a pulse rate of 80 and a respiratory rate of 20. The patient was well developed and well nourished; she was in no apparent distress but appeared toxic. The skin of the entire body, including the palms of the hands and the soles of the feet, showed a discrete, rather sparsely situated erythematous maculopapular rash which faded on pressure. Examination of the abdomen gave negative results except for a palpable spleen. In the right inguinal region was a small healed area immediately over a swollen lymph node; this was stated to be the area of the initial tick bite. The urine on admission was normal. Examination of the blood showed hemoglobin 12.5 per cent, red cells 3,830,000, white cells 9,800 with 81 per cent polymorphonuclear leukocytes, 14 per cent lymphocytes and 5 per cent endothelial cells. The polymorphonuclear leukocytes were young and granular. The sedimentation rate was 2 per cent in one-half hour and 3.5 per cent in one hour. Serologic examination gave negative results. The blood chemistry was normal. An agglutination test for *Bacillus abortus* and Widal tests were negative on June 3. Blood cultures taken on May 30 and 31 and June 2 were consistently negative at three days. Culture of the urine was negative. Culture of the feces was not contributory. The patient was treated conservatively and given acetylsalicylic acid and cold sponges for high temperature and sedation. The urine on June 3 and 7

continued to be normal. Blood counts remained about the same throughout her entire hospital course. The patient averaged three chills a day, her temperature rising from 100 to 105 F. for four days. She appeared acutely ill and the eruption became much more severe and more confluent. By June 3 the lesions were hemorrhagic and thickest about the wrists and ankles. The Weil-Felix reaction on June 5 was negative and on June 11 positive in dilutions of 1:50 to 1:200. Sulfapyridine therapy was instituted on June 3 with a view to preventing the chills and high fever. The temperature immediately fell and the patient appeared to improve clinically, with healing of the tick bite and disappearance of the adenopathy. By June 10 the temperature reached normal and remained so. The remainder of the hospital course was satisfactory, the eruption faded gradually and the patient was discharged June 14.

CASE 2.—A man aged 44 entered Presbyterian Hospital May 22, 1940 as a patient of Dr. Charles Jaeger. The patient had gone on a fishing trip over the week end of May 18 and after returning home on Sunday the 19th discovered a tick attached to the skin of the abdomen below and to the right of the umbilicus. The tick was removed Sunday evening by Dr. Jaeger by excising a small piece of skin in which the tick's head was firmly embedded. On May 21 the patient had a hard chill with a subsequent fever and headache. These symptoms became more severe and the patient was sent to the hospital the following morning. On admission the patient was well nourished and well developed and had a distinct dusk flushing of the face; he complained of a severe backache, headache and aching of the bones and joints. He appeared acutely ill; there were no abnormalities in the chest or abdomen except the injury of the abdominal wall at the point at which the tick had been removed. The temperature was 100.6 F. A provisional diagnosis of a tick-borne infection was made. On May 23 the flexor surfaces began to break out with a light red distinct macular cutaneous eruption which disappeared on pressure. During the next four days the eruption continued to spread until it involved the entire cutaneous surface, being sparse over the face. The individual macular lesions enlarged and in many areas coalesced, forming bizarre shaped plaques. The entire eruption became dark red and no longer would fade on pressure, since it had now become very definite hemorrhagic spots. The appearance of the eruption changed very little during the next two weeks. During the first three weeks after admission the patient had a stormy course, being seriously ill, the temperature ranging between 101 and 104 F. and the pulse rate between 100 and 120. He was semicomatose but could be aroused, and when aroused he appeared quite clear mentally. On the twenty-first day the temperature dropped to normal and remained at that level. He left the hospital on the twenty-ninth day with pigmentation of the skin remaining at the points of the eruption and with definite evidence of myocardial damage. The white blood cell count remained between 12,000 and 20,600 during the period of hospitalization and the Weil-Felix reaction was positive on June 10.

CASE 3.—A white man aged 62, a carpenter, was admitted to the Colorado General Hospital May 19, 1937 at 5:30 p. m. He had for the last twelve months been making rustic tables for the tourist camp at Lyons, Colo. For some days he had been working in the timber getting wood for these tables. On May 9 he had chills. The next day he tried but was unable to work as vomiting began and he could not hold anything on his stomach. On Wednesday, the third day, he was taken to his home. At this time there were some red spots on his arms and chest. After he came home his chills and fever continued and his temperature was once recorded at 105 F. During the last few days his rash increased. He had become very apathetic and confused mentally. The patient had a florid complexion, his eyes were rather badly inflamed and he breathed noisily through his mouth. He appeared extremely toxic. The physical examination was not remarkable and nothing of any great significance was encountered with the exception of the rash which covered the entire body surface except the face. The rash was maculopapular and did not fade on pressure. It appeared to represent small hemorrhages in the cutaneous capillaries. The chest was examined carefully because the

breathing was peculiar; there seemed to be no particular explanation for the apparently labored breathing. The chest was resonant and no rales or adventitious breath sounds were elicited. The urine was practically normal. The white blood cell count showed 14,680 leukocytes with a differential of 94 per cent polymorphonuclears. The temperature on admission by rectum was only 102 F. and a few hours later dropped to 100.4 F. by rectum. The pulse, however, crossed the temperature curve and rose to 120. The patient was confused mentally. May 21 at about 5:15 or 5:20 p. m. he became very much confused and began breathing strenuously. The breathing was not the short, gasping of true dyspnea but seemed to be a breathing produced by an unusual respiratory stimulation. The breaths were full and the expansions of the chest were full, but the number of respirations were 45 or 50 a minute. At this time there was nothing on auscultation of the chest to indicate any respiratory or cardiac difficulty within the chest itself. The patient at first aroused when spoken to and turned his eyes in the direction of the speaker, but he was unable to speak. The respirations soon slowed and then ceased, the heart continuing to beat for several minutes. The patient was pronounced dead at 6:20, just about an hour after the onset of the rapid respiration and the coma. Permission for autopsy was obtained and the diagnosis of Rocky Mountain spotted fever was confirmed by the department of pathology by guinea pig inoculation of postmortem heart's blood and by microscopic examination of the cutaneous and visceral lesions.

SUMMARY

1. The literature shows that cases of Rocky Mountain spotted fever have been reported from thirty-seven of the forty-eight states.

2. Rocky Mountain spotted fever is transmitted to human beings through infected ticks, and the causative organism is *Dermacentor rickettsii*.

3. Three types of the disease are recognized: the mild, the severe and the fulminating.

4. The cutaneous manifestations of Rocky Mountain spotted fever are characteristic.

5. A drug exerting any great amount of specific action against this infection has not been found.

6. Vaccine gives partial protection for a period of one year or less.

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ABSTRACT OF DISCUSSION

DR. RICHARD J. BAILEY, Spokane, Wash.: I congratulate Dr. Hutton on his comprehensive summary of our knowledge of this disease. It is important to emphasize that the term "Rocky Mountain spotted fever" is a misnomer. The disease is not localized in the Rocky Mountain states or even in the Bitter Root Valley but is found, roughly, throughout the entire country, as it has been reported in all the states except Wisconsin, Michigan and four New England states. It is important also to reemphasize that there is no distinction between the eastern and the western type of this disease. Tourists rarely acquire the disease because they are more alert to the menace when they are in tick infested areas. There is one good reason for a dermatologist to discuss a disease which is primarily in the realm of general medicine. This reason may be expressed in an objection to the use of the term "characteristic eruption" in Rocky Mountain spotted fever, because we all know that we have seen exactly similar pictures in subacute disseminated lupus erythematosus, in severe toxic types of drug eruptions and in many other conditions. According to Dr. Parker, director of the Spotted Fever Institute, the differential diagnosis of this disease is becoming more difficult because the eruption has been modified by vaccination and because of the widespread use of the sulfanilamide type of drug. In these days such drugs are given early in any undiagnosed febrile disease, and we are often confronted with a mixed or a definite drug eruption in addition to the disease itself. Dr. Parker stated recently that one fourth of the vaccine available this year has been prepared from chick embryo and that next year one half of the quantity distributed

will be of that type. It has been in use, however, for too short a time to evaluate it and predict any superiority to the type available at the present time. I should like to ask Dr. Hutton for any information that he may have regarding the new therapeutic vaccine for this disease, publicized recently in lay magazines.

THE EFFECT OF RENIN ON EXPERIMENTAL RENAL HYPERTENSION IN THE DOG

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Of the numerous methods reportedly available for producing hypertension in animals¹ (table 1), the most satisfactory is that of constriction of the renal arteries reported by Goldblatt² in his now classic experiment. During the past several years, moreover, there has accumulated growing evidence of similarity between experimental renal (Goldblatt) hypertension in the dog and essential hypertension as found in the great majority of patients so diagnosed³ (table 2). Although a therapeutic agent which is effective in experimental renal hypertension may prove ineffective in essential hypertension, and vice versa, any new therapy proposed for essential hypertension should first receive an adequate trial in experimental renal hypertension. As a consequence, a number of attempts have been made to reduce the blood pressures of renal hypertensive dogs. Only a few of these efforts have met with some degree of success.

Thus Davis and Barker⁴ reported that potassium thiocyanate reduced the blood pressures of dogs with renal hypertension. Both Weeks and his associates⁵ and Cerqua and Samaan⁶ found that nephrosplenectomy caused a more or less permanent decrease in the blood pressures of dogs rendered hypertensive by the Goldblatt technic. Katz and his co-workers⁷ reported that transplanted autolyzing kidney tissue reduced the blood pressures of dogs with renal hypertension, but Goldblatt⁸ could not confirm their finding. Harrison and his collaborators⁹ reported reductions in the blood pressures of dogs with renal hypertension and of human

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beings with essential and malignant hypertension by means of a kidney extract containing the antipressor substance believed to be present in normal kidney tissue. Because of untoward effects observed in a number of their dogs, as well as for other reasons, these authors reserved judgment relative to the ultimate specificity and value of this form of therapy. Page and his associates,¹⁰ using a similar antipressor kidney extract, likewise reported favorable effects on the blood pressures of hypertensive dogs and human beings. Both of these groups considered this antipressor substance to be different from any of the known depressor agents.

In spite of these advances, however, the treatment of experimental renal hypertension in the dog and essential hypertension in man is still an unsettled problem. Obviously the production of an increase in collateral circulation to the constricted kidney by nephrosplenopexy has at best a limited applicability to the therapy of essential and malignant hypertension in man, since, if renal ischemia is involved in the pathogenesis of the clinical condition, it is ordinarily because of arteriosclerosis rather than narrowing of the renal arteries. More work is necessary to determine the comparative effectiveness of the type of kidney extract used by Harrison and by Page and other known anti-

ney in experimental renal hypertension, we studied the effect of hog renin on the blood pressures of dogs with renal hypertension. Our original thesis, of course, was that if renin was the pathogenetic pressor agent in experimental renal hypertension, the injection of hetero-

TABLE 2.—Similarities Between Experimental Renal Hypertension and Essential Hypertension

1. Reduced (?) renal blood flow
2. Essentially normal renal function tests
3. Normal cardiac output, blood volume, blood viscosity, and elasticity of arteries
4. Increased peripheral resistance, chiefly arteriolar
5. Normal pulmonary circulation pressures
6. Normal blood chemistry
7. Essentially normal hematologic picture
8. Endocrines (adrenals, pituitary, gonads and thyroid) not involved pathogenetically
9. Arteriosclerosis involving various organs conditioned by duration hypertension
10. Increased renin content of kidney

ologous hog renin into dogs with renal hypertension might lead to a reduction in blood pressure as the result of the in vivo neutralizing effect of antirenin so produced.

METHODS

Dogs were rendered hypertensive by the Goldblatt technic and the resulting hypertension was allowed to stabilize over a period of from three to twenty-three months before injections of renin were begun. Mean blood pressure readings were obtained by puncture of a femoral artery two or three times a week. Studies on the blood urea nitrogen, urinalyses and determinations of the body weight were made at biweekly intervals. The dogs were treated with daily intramuscular injections of renin for four months each. The renin solutions used were equivalent to 1 Gm. of fresh kidney cortex per cubic centimeter of solution and were administered in a dose of 1 cc. per kilogram of body weight. The method used for the preparation of renin was essentially that described by Grossman,¹² except that acetone was used as a dehydrating agent and much of the associated protein was removed by isoelectric precipitation. To date 4 dogs with hypertension have been treated with hog renin, 2 with hog renin inactivated

TABLE 1.—Methods of Producing Experimental Hypertension

1. Desoxyeortleosterone
2. Continuous intravenous infusion of epinephrine
3. Hypervitaminosis D
4. Intraaortic injection of kaolin
5. Bilateral section of carotid sinus and aortic depressor nerves
6. Kidney antiserum nephritis
7. High voltage irradiation of kidneys
8. Ureteral obstruction
9. Partial obstruction of renal veins
10. Cellophane perinephritis
11. Constriction of renal arteries

hypertensive agents, as well as its specificity for experimental renal hypertension and clinical essential or malignant hypertension.

A year ago we¹¹ reported the successful production of an antiserum for dog renin in the rabbit and for hog renin in the dog. The active principle of the antisera, which we designated "antirenin," was shown to neutralize the acute pressor effect of the antigenic renin (illustrated in the tracing). Since then we have produced antisera for various species of renin in different species of animals, as shown by table 3. As indicated by this table, moreover, dog renin in the dog and rabbit renin in the rabbit failed to produce an antiserum for renin, thus demonstrating that the production of antirenin depends on the heterologous character of the injected renin. The antisera were also shown to neutralize not only the acute pressor effect of the antigenic renin but also that of other species of renin. Thus, for example, dog antiserum against hog renin neutralized the acute pressor effect of dog renin.

In view of these observations relative to antirenin and of the increasing possibility that renin is the pathogenetic pressor agent released from the constricted kid-

TABLE 3.—Antisera for Various Renins Produced in Different Species

Renin of	Animal Injected	Result
Hog.....	Dog	Antirenin
	Rabbit	Antirenin
	Guinea pig	Antirenin
Dog.....	Rabbit	Antirenin
	Dog	No antirenin
Rabbit.....	Dog	Antirenin
	Guinea pig	Antirenin
	Rabbit	No antirenin
Cat.....	Rabbit	Antirenin
	Guinea pig	Antirenin

by heating at 70 C. for one-half hour and 2 with (homologous) dog renin.

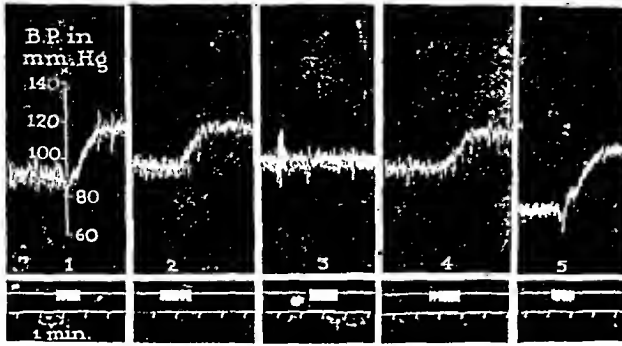
Blood sera were examined for antirenin before treatment and subsequently at two week intervals. The technic previously described¹¹ consisted essentially in mixing 2 volumes of serum with 1 volume of renin

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11. Johnson, C. A., and Wakerlin, G. E.: Antiserum for Renin, *Proc. Soc. Exper. Biol. & Med.* 44:227 (May) 1940.

12. Grossman, E. B.: Preparation of Extracts of the Renal Pressor Substance, *Proc. Soc. Exper. Biol. & Med.* 39:40 (Oct.) 1938.

solution, allowing the mixture to stand at least overnight at 4 C. and assaying the acute pressor effect of the mixture intravenously on the etherized, nephrectomized dog. The dose of renin solution employed was 0.5 cc. per kilogram of assay animal. In all instances the serum tested for antirenin was suitably controlled



Section 3 shows neutralization effect of (rabbit) antiserum on pressor response to dog renin. Sections 2 and 4 are controls in which normal rabbit serum and dog renin were used. Sections 1 and 5 show pressor response to dog renin alone.

with serum from normotensive dogs and frequently with serum from untreated hypertensive dogs. Antirenin titers for both hog and dog renins were determined.

At the present writing, 1 of the 4 dogs which received hog renin has been observed for twelve months and the other 3 have been observed for eight months since treatment has been discontinued. The 2 dogs given inactivated hog renin and the 2 animals injected with dog renin have been under observation for four months and two months respectively since the cessation of treatment.

When the results in these 8 animals became apparent, we decided to reverse our experiment and also study the effect of renin similarly administered to normotensive dogs prior to constriction of the renal arteries. Accordingly, 2 normotensive dogs were observed during a control period of three months. Hog renin was then injected for approximately six months; in the middle of this period the renal arteries were constricted three weeks apart. Two months have elapsed since the injections with hog renin have been discontinued. Determinations of blood pressure, studies on

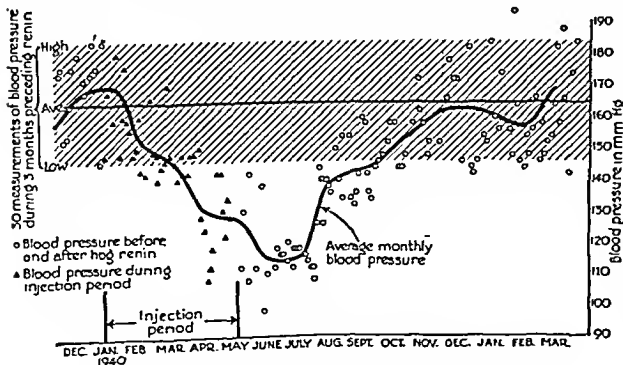


Chart 1.—Effect of daily injections of hog renin on the blood pressure of dog 1 with renal hypertension.

the blood urea nitrogen, urinalyses, determinations of body weight and assays of antirenin were likewise made on these 2 animals.

RESULTS

Hog Renin in Hypertensive Dogs.—The intramuscular injections of hog renin produced striking reductions in the blood pressures of the 4 hypertensive dogs.

These results are presented graphically in charts 1 to 4.

The first hypertensive dog showed an average femoral blood pressure of 164 mm. of mercury with a maximum of 184 mm. and a minimum of 146 mm. during the three months preceding treatment. As shown by chart 1, the blood pressure of the animal fell more or less steadily throughout the period of injections of hog renin until the normal or prehypertensive range was reached in the fourth month of treatment. During the two months following renin therapy, the blood pressure dropped somewhat below the original normotensive level. In the succeeding five months the pressure slowly rose to reach the pretreatment hypertensive range, at which it has remained for the past five months.

The second dog was hypertensive for nine months prior to the injections of renin, although only the last six

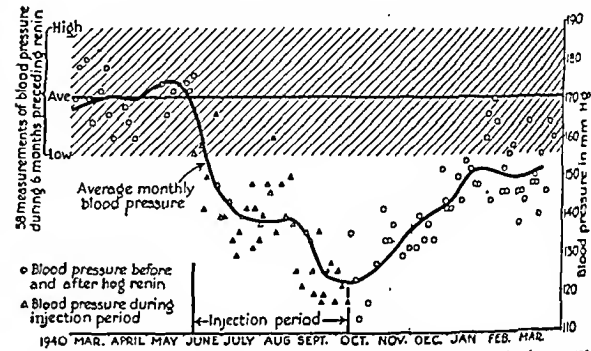


Chart 2.—Effect of daily injections of hog renin on the blood pressure of dog 2 with renal hypertension.

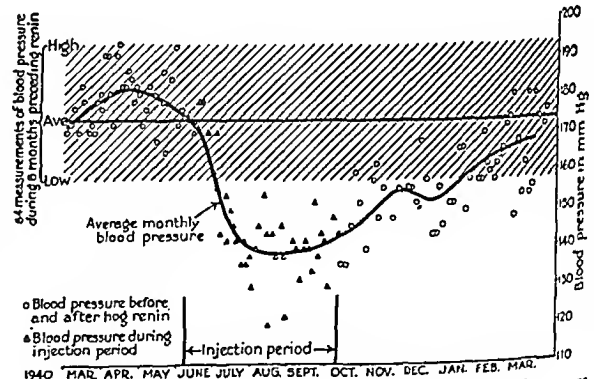


Chart 3.—Effect of daily injections of hog renin on the blood pressure of dog 3 with renal hypertension.

months of this period are recorded in chart 2. As illustrated, the blood pressure decreased during the four months of treatment until the prehypertensive level of the animal was reached by the end of the third month and a range slightly below the original normotensive level was attained in the fourth month. During the eight months following treatment the pressure has gradually risen to practically the pretreatment hypertensive level.

The third dog was hypertensive for seventeen months prior to renin therapy, although only the last eight months of this period are recorded (chart 3). As indicated, the blood pressure fell to the prehypertensive level by the end of the second month of treatment and remained in this range throughout the remainder of the treatment period. During the months that have elapsed since the last injection of renin, the blood pressure has shown a gradual rise to the hypertensive range.

The fourth dog (chart 4) was hypertensive for twenty-three months before injections of hog renin were begun, the last fifteen months of this period being recorded. The blood pressure of this dog fell to the lower limits of the hypertensive range during the first two months of treatment and remained there for the rest of the treatment period. During the two months following injections of renin, the pressures continued essentially unchanged but subsequent to this showed an abrupt return to the pretreatment hypertensive level, where they have remained.

At no time during treatment or subsequently was there any clinical evidence of untoward effects. The appetites of the 4 dogs remained excellent, their weights constant and their blood urea nitrogens and urines remained normal throughout the period of observation.

Before the administration of hog renin, the serums of the dogs showed no neutralizing effect (antirenin) for hog or dog renin. Repeated examinations of the serums of 40 normotensive and 10 untreated hypertensive dogs used as controls likewise showed no neutralizing effect for these renins. Antirenin to hog renin became demonstrable by the end of the first month of treatment and with variations in the 4 dogs reached a sufficient titer by the end of the third month to neutralize completely the acute pressor effect of hog

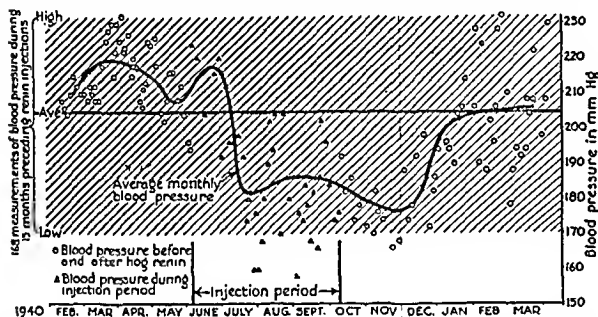


Chart 4.—Effect of daily injections of hog renin on the blood pressure of dog 4 with renal hypertension.

renin by the assay technic employed. With fluctuations, the antirenin titer for hog renin has remained essentially unaltered in the first dog up to the present time (some twelve months since treatment has been discontinued). In the other 3 animals, on the contrary, antirenin disappeared from the serums more or less coincidentally with the return of the blood pressures to the pretreatment hypertensive range. The neutralizing effects of the serums of the treated animals for dog renin closely paralleled the antirenin titers for hog renin.

Inactivated Hog Renin in Hypertensive Dogs.—The intramuscular injections of inactivated hog renin produced no significant change in the blood pressures of the 2 hypertensive dogs so treated. The results for 1 of the dogs are illustrated by chart 5.

This dog was hypertensive for seven months before injections of inactivated hog renin were begun, the last three and one-half months of this period only being recorded in chart 5. A slight but not significant rise in blood pressure occurred during the four month period of injections. In the four months since the discontinuance of injections there has been no significant change in the hypertensive level.

The results with the second dog were completely comparable. Not only did the inactivated hog renin

have no effect on the blood pressures of the hypertensive dogs but antirenin failed to appear in the serums. Likewise, there were no toxic manifestations noted in either of the animals.

Dog Renin in Hypertensive Dogs.—The injections of dog renin into 2 hypertensive dogs resulted in a

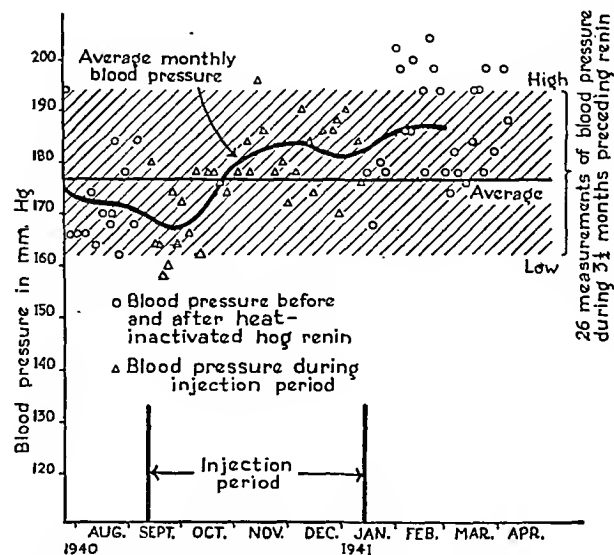


Chart 5.—Effect of daily injections of inactivated hog renin on the blood pressure of a dog with renal hypertension.

moderate but significant rise in blood pressure, as illustrated by chart 6.

The dog whose course is charted was hypertensive for three months preceding injections of dog renin. During the second month of injections there was a more or less abrupt rise of approximately 25 mm. of mercury in the average monthly blood pressure, which persisted throughout the period of injections and has remained

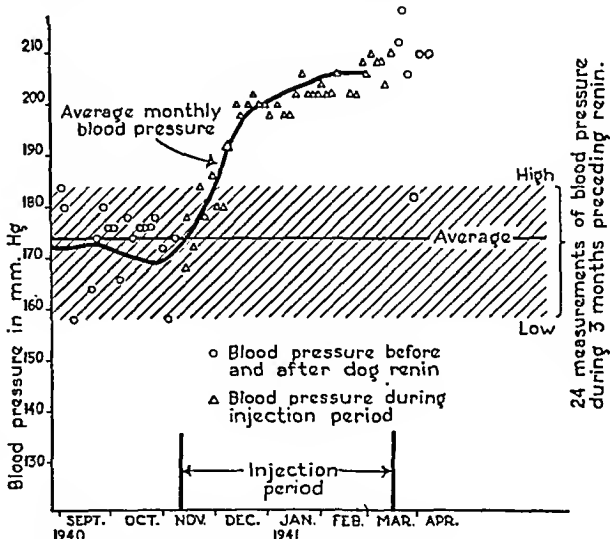


Chart 6.—Effect of daily injections of dog renin on the blood pressure of a dog with renal hypertension.

during the two months of observation since the injections have been discontinued.

Similar results were obtained with the second dog. Repeated assays for antirenin against both hog and dog renins gave uniformly negative results in both dogs. Neither animal showed any detectable evidence of toxic effects from the injections.

Hog Renin in Normotensive Dogs.—The intramuscular injections of hog renin produced no significant change in the blood pressures of the 2 normotensive dogs. Bilateral constriction of renal arteries likewise failed to produce any significant change in blood pressure, contrary to the customary hypertensive response in the untreated animal (chart 7).

The dog whose course is illustrated in chart 7 has shown no significant change in blood pressure during the six months of injections of hog renin, two of which were subsequent to bilateral constriction of the renal arteries. During the two months since the discontinuance of treatment, the pressure has likewise remained unchanged.

The results with the second dog were similar. During the second month of injections antirenin to hog and to dog renin developed in both dogs and has persisted to date. The 2 animals appear otherwise normal.

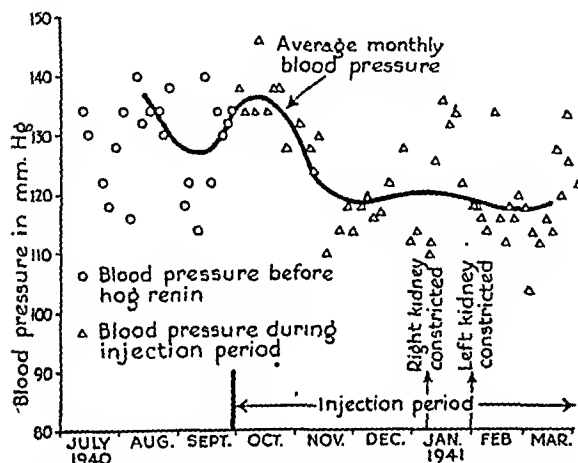


Chart 7.—Effect of daily injections of hog renin on the blood pressure of a normotensive dog before, during and after constriction of renal arteries.

COMMENT

This report is obviously preliminary in character. However, the blood pressure reductions obtained in the 4 hypertensive dogs by treatment with hog renin, in the absence of any overt evidence of toxic effects, are so striking that we have good reason to believe that they will be duplicated on a larger group of animals. In general there was some correspondence between the magnitude of the fall in blood pressure and the length of the period of hypertension preceding treatment with hog renin. Thus, as indicated by charts 1 to 4, the decrease in blood pressure was greatest in the first dog, which had been hypertensive for only three months, and least in the fourth animal, which had been hypertensive for nearly two years preceding injections of hog renin. Most probably these differences are related to the degree of arteriosclerotic change present. We likewise expect to duplicate the negative results with inactivated hog renin and with dog renin in larger groups of dogs with renal hypertension.

In addition to the controls with heat-inactivated hog renin and with dog renin, other control experiments are necessary: 1. The effect of other species of renin must be studied. At the present time we are conducting experiments with rabbit renin in experimental renal hypertension. We predict that while the homologous (dog) renin will not lower the blood pressure of a renal

hypertensive dog, any heterologous renin most probably will. 2. The effect of highly purified preparations of renin as well as the optimal frequency, dosage and mode of administration must be studied. 3. The action of extracts of various tissues from the hog and other species prepared after the manner of renin must be determined.

We have already emphasized the lack of harmful effects in these dogs given injections of various renins. The absence of albuminuria is cogent evidence against significant renal damage.¹³ However, in view of the toxic effects of kidney extracts in nephrectomized dogs reported by Winternitz and his associates,¹⁴ we propose to examine our dogs with additional tests for renal, hepatic and other functions, as well as grossly and microscopically at necropsy. Worthy of note is the fact that, contrary to the suggestion of others,¹⁵ the observed reduction in blood pressure per se did not cause toxic manifestations.

Certainly much work must be done before the mechanism of these striking reductions in the blood pressures of the 4 hypertensive dogs produced by hog renin is clarified. The fact that the hog and dog antirenin titers of the serums of the 4 animals rose simultaneously with the reductions in blood pressure and likewise fell more or less coincidentally with the return of the blood pressures of 3 of the 4 animals to the hypertensive range suggests the possibility that antirenin may be responsible. However, as previously stated, antirenin has persisted in the serum of the first dog treated with hog renin in spite of the fact that the blood pressure of the animal has been in the pretreatment hypertensive range for the past five months. This obviously speaks against the antirenin hypothesis. On the other hand, inactivated hog renin and active dog renin both failed to reduce the blood pressures of dogs with renal hypertension and likewise did not lead to the production of antirenin. The observation that the acute pressor effect of intravenously administered hog and dog renins was obtained in our treated hypertensive and normotensive dogs in the presence of antirenin should likewise not be construed against the antirenin hypothesis, since we have found that the *in vitro* neutralization of renin requires a period of hours. Of possible significance also is our finding that the typical renin curve is modified in the animals showing antirenin in that the blood pressure return is more rapid than normal. The fact that a heterologous (hog) renin and not the homologous (dog) renin was effective speaks for the probability that the reductions in blood pressure of the 4 hypertensive dogs resulted from some type of immune or antihormone response to renin or less probably to some other heat labile constituent of the kidney cortex of the hog. Another, though less likely, possibility is the presence of a significantly greater concentration of some directly antihypertensive agent in the hog renin solution as compared with the dog renin solution.

The group of 2 dogs prophylactically treated with hog renin and thereby protected against the hyperten-

13. Brucer, Marshall, and Robinson, S. C.: Hypertension and Kidney Function: Relationship of Albuminuria to Blood Pressure, Weight, Body Build and Surface Area, *Am. J. Clin. Path.* **10**: 800 (Nov.) 1940.

14. Winternitz, M. C.; Mylon, E.; Waters, L. L., and Katzenstein, R.: Studies on Relation of Kidney to Cardiovascular Disease, *Yale J. Biol. & Med.* **12**: 623 (July) 1940.

15. Williams, J. R., Jr.; Grollman, Arthur, and Harrison, T. R.: The Reduction of the Blood Pressure of Hypertensive Dogs by the Administration of Renal Extract, *Am. J. Physiol.* **130**: 496 (Sept.) 1940.

sive effect of bilateral renal artery constriction is admittedly small and must be increased before final conclusions can be drawn. Moreover, suitable control experiments must be performed. The absence of hypertension in these 2 animals, however, is most probably not fortuitous, since we have never failed to obtain some degree of hypertension in more than 50 dogs subjected to bilateral constriction of the renal arteries by a similar technic. We have been watching these 2 dogs with considerable interest since hog renin therapy was stopped two months ago. If the antirenin titers of the animals fall as their blood pressures rise to a hypertensive level during the next several months, the antirenin hypothesis will be strengthened but by no means proved.

Without much question the antihypertensive action of the injections of hog renin was not due to the coincidental presence of the antipressor substance under investigation by Harrison and his co-workers⁹ and by Page and his associates.¹⁰ Thus the amounts of kidney equivalent used by them were much larger than those employed by us, the blood pressure reductions produced by therapy were more prompt in their animals than in ours and the blood pressure increases following the cessation of treatment usually occurred earlier in their dogs than in ours. Furthermore, no signs of toxicity accompanied the reductions in blood pressure in our dogs. Moreover, Harrison and his associates¹⁶ have shown that their principle inhibits the acute pressor effect of renin and that it is extractable from dog kidney and, presumably when so obtained, effective in the hypertensive dog. On the other hand, Page and his associates¹⁰ state that their antipressor extracts contain renin.

If the promise of our preliminary observations is substantiated by further work in the experimental animal, this type of treatment will be studied in essential hypertension in man.

CONCLUSIONS

1. Daily intramuscular injections of hog renin for four months produced striking reductions in the blood pressures of dogs with renal hypertension, whereas heat-inactivated hog renin and active dog renin were without effect.

2. No detected toxic manifestations resulted from the injections of renin or from the reductions in blood pressures.

3. The serums of the dogs treated with hog renin, but not the serums of the dogs given injections of inactivated hog renin or dog renin, neutralized the acute pressor effect of renin (antirenin).

4. Daily intramuscular injections of hog renin into 2 normotensive dogs before and after constriction of the renal arteries prevented the development of hypertension.

5. The mechanism of these therapeutic and prophylactic effects of hog renin in experimental renal hypertension in the dog is not clear. Most probably an immune (antihormone?) response to heterologous hog renin is involved.

1853 West Polk Street.

ABSTRACT OF DISCUSSION

DR. HARRY GOLDBLATT, Cleveland: The treatment of renal disease, with or without hypertension, in man, especially so-called essential hypertension, by the administration of renal substances in various forms and by various methods, is very old. The directing idea of this form of therapy was always substitution for some form of deficiency, hormonal or otherwise. The treatment of hypertension, experimental or otherwise, by the injection of a pressor substance, with the idea of developing an antipressor substance in the blood, is immunologically old but for this particular problem quite new. I am sure, from what Dr. Wakerlin has said, that he and Dr. Johnson are aware of the danger of concluding that the effects they observed in these few incomplete experiments were actually due to the development of an antipressor substance in the blood. They have pointed out that in the first dog, their best experiment, after the cessation of therapy, the blood pressure promptly returned to the original high level, although the antipressor substance, the antirenin, remained at the original high level. This inconsistency remains unexplained and many more experiments must be performed to elucidate this point. Other investigators have succeeded in reducing the blood pressure in hypertensive animals and man by means of renal extracts that are supposed to contain antipressor or so-called inhibitor substance. Dr. Lewis, Dr. Kahn and I have found that these extracts, which are supposed to contain only antipressor or inhibitor substances, also contain renin in much greater concentration than in the extract which was used by Drs. Wakerlin and Johnson. It is at least possible, therefore, that the effects which are being attributed to antipressor or inhibitor substances in the extracts used by these other investigators are due, after all, to renin. It is equally true that Drs. Wakerlin and Johnson are dealing with very crude products and not with pure renin, so that the effects which they have obtained may possibly be due either to inhibitor or to antipressor substance present in their extract. All investigators should refer to the products they are using merely as renal extracts, identified by letter or number, and not as renin, or inhibitor or by any other name, until the effective substance, in pure form, is isolated and identified. All the investigators are dealing with relatively crude products. It would be well, therefore, to refrain from any controversy about whether the effective substance is renin or inhibitor. Neither has yet been proved. It should, however, be the common endeavor of all investigators in this field to isolate and identify the effective substance.

DR. LOUIS N. KATZ, Chicago: Dr. Myron Prinzmetal has informed me that he has been able to confirm the blood pressure lowering effect of hog renin on seven rabbits, using a technic similar to that of Wakerlin and Johnson. However, he found that an immediate rise in blood pressure occurred on injection during the period of lowered blood pressure and afterward, as well as in the control period. This would tend to oppose the idea that the pressure drop is due to an antihormone developing in the dog following the hog renin injections. I should like Dr. Wakerlin to comment on the results of Dr. Hessel, who a few years ago reported that injection of heterologous renin extracts in rabbits gives rise to a hypertension which persisted long after the injections were discontinued. I agree with Dr. Goldblatt that we must not be misled in our thinking by ascribing particular specific properties to these crude preparations, which probably contain many substances most of which are still unknown pressor or depressor materials. Early in our work we were impressed with the importance of the normal kidney as a mechanism for preventing or neutralizing renal hypertension. Dr. Rodbard and I found that the normal kidney far exceeded any other tissue in this ability, and this mechanism appears to be due to the metabolic activity of the normal kidney. We have done other experiments in which kidney tissue was implanted subcutaneously in hypertensive dogs and found that as we produced abscesses the blood pressure dropped toward normal and the drop persisted for some time after the abscesses had resolved. We carried out some one hundred and twenty-

16. Grollman, Arthur; Williams, J. R., Jr., and Harrison, T. R.: Preparation of Renal Extracts Capable of Reducing Blood Pressure of Animals with Experimental Renal Hypertension, *J. Biol. Chem.* 134: 115 (June) 1940.

five experiments including controls, of which twenty-five dealt with kidney implantation in hypertensive animals, and in all but three of the latter we obtained a similar depressor effect. In repeating this work Goldblatt found that implantation of kidney tissue had no effect on the blood pressure if no abscess was produced. This would apparently confirm our view that an abscess must be formed before the blood pressure lowering effect appears. However, this effect is apparently not dependent on infection, since, as Wakerlin showed, severe mixed infections do not affect the blood pressure, nor, as we found, does this occur with other than kidney abscesses. How these implant experiments are related to the extracts discussed today remains to be determined. While renal hypertension in the animal is apparently the only method so far available of reproducing a condition similar to essential hypertension in man, it is not true that clinical essential hypertension is necessarily renal in its origin. While the kidney may be the intermediate step in its production, the renal changes are produced by some other factor.

DR. JOHN R. WILLIAMS, Winston-Salem, N. C.: My associates and I have recently attempted to confirm this interesting work of Wakerlin and Johnson. We treated 2 dogs with renin for two months with no drop in blood pressure. Several reasons may account for our inability to confirm their results; the period of treatment was rather short. Renin is not a pure substance but a crude extract and when prepared in different ways has different pharmacologic properties, so that it seems possible that renin prepared one way might give this effect. Whether the effects observed by Wakerlin and Johnson are the same as those induced by the renal antipressor substance cannot be decided without further work.

DR. G. E. WAKERLIN, Chicago: It is obvious, as Dr. Goldblatt said, that we must have more experiments. Possibly we are dealing with the antipressor substance which Harrison and Page have reported on, but this is unlikely. It is possible also that Harrison and Page have been working with the same mechanism which we are interested in. Certainly our extracts are crude. They contain not only renin but a number of substances of unknown character. If some directly antipressor substance is present in them, it must be present in appreciably greater concentration in hog renin than in dog renin. The fact that Dr. Prinzmetal was able to obtain a rise in blood pressure by the intravenous injection of renin into those rabbits is not against the antirenin hypothesis. As we pointed out, the mixing of the antiserum with renin requires a period of hours for complete neutralization. It is not surprising, therefore, that an acute intravenous injection of renin produces a pressor effect in animals showing antirenin. However, the pressor effect is not entirely typical, according to our findings, in that the return of the blood pressure is much more rapid than in the untreated hypertensive or normal animal. It is possible, therefore, for antirenin to neutralize a continuous release of small quantities of renin from the constricted kidneys of the Goldblatt dog. However, we emphasize again that we are not certain of antirenin being the mechanism. We too have found that repeated injections of renin, provided they are homologous, give rise not to a fall in blood pressure but to an increase. I do not recall Dr. Hessel's experiments well enough to remember whether he used heterologous or homologous renin. I agree with Dr. Katz that we cannot say that experimental renal hypertension in the animal is the same as essential hypertension in man. However, I do not think that any one is justified in using a proposed therapeutic agent in essential hypertension in man today without having previously tried it in experimental renal hypertension in the dog. We are interested in Dr. Williams' report that he has tested hog renin in two dogs by the same technic used by us, except that he injected the hog renin for only two months. I think he should have run his experiments as we did for at least four months. As he stated, he is drawing no conclusions. Dr. Williams emphasized the crude character of the renin solutions with which we have worked. We agree with all he said from that point of view.

THE SUPRASPINATUS SYNDROME

SYMPTOMATOLOGY, PATHOLOGY AND REPAIR

DAVID M. BOSWORTH, M.D.

NEW YORK

Since 1933 I have had 53 patients whose shoulders have been radically explored and repaired. In a previous communication the pathologic conditions found were reported, a classification offered and a new method of repair proposed.¹ I have made a follow-up examination of all except 3 patients. There have been no deaths, infections or major catastrophes.

There were 28 cases originally reported, and to these are added 25 others. My previous classification of the pathologic lesions found holds true for the new cases, but with the addition of two subheadings, namely 2 E and 4 C. The complete classification is as follows (fig. 1):

1. Pathologic condition not found, 2 cases.

2. Lesions of tendons.

A. Complete avulsion of the short rotator cuff (tendons of the supraspinatus, infraspinatus, teres minor and subscapularis muscles), 4 cases.

B. Laceration or avulsion of one or more short rotator tendons in their substance or at their attachments, 30 cases.

C. Musculotendinous separation of the supraspinatus and the infraspinatus muscles, 1 case.

D. Calcification or ossification of the supraspinatus tendon (plus surrounding calcification and degeneration), 5 cases.

E. Lesions of the subscapularis tendon (recurrent dislocation), 3 cases.

3. Bursal lesions.

A. Obliterative subacromial bursitis (frozen shoulder), 7 cases.

B. Laceration of the bursal floor without tendinous involvement, 1 case.

4. Lesions of bone.

A. Sharp exostosis at the tendinous attachment of the greater tuberosity without other pathologic condition, 1 case.

B. Rounded exostosis on the greater tuberosity associated with tendon laceration, 2 cases.

C. Osteochondritis.

(a) localized, 1 case.

(b) generalized, 1 case.

It must be noted that in certain instances double lesions existed and had to be classified under two headings. Hence the number of pathologic lesions found was in excess of the number of shoulders explored.

1. PATHOLOGIC CONDITION NOT FOUND

In my first series there was a patient aged 42 who had a classic picture of rupture of the supraspinatus tendon, with loss of abduction and an inconstant catch in the shoulder, localized tenderness and protection on unguarded motion. Operative intervention disclosed no pathologic condition whatever. A follow-up examination six and one-half years later revealed no defect in the shoulder except slight restriction of internal rotation. Another patient, a neurotic school girl aged 18, was found to be toying with the idea of a lawsuit. She

From the Orthopaedic Service at St. Luke's Hospital.
Read before the Section on Orthopedic Surgery at the Ninety-Seventh Annual Session of the American Medical Association, Cleveland, June 5, 1941.
1. Bosworth, D. M.: *J. Bone & Joint Surg.* 22: 369-372 (April) 1940.

so readily assumed symptoms of deep surface tendon laceration that it was impossible to judge as to its actual presence or absence. On exploration considerable relaxation of the whole tendinous cuff seemed to be present, but no other pathologic condition was found. It is of course possible that the patient had a small osteochondritic defect in the humeral head underlying the supraspinatus or the infraspinatus tendon and that this defect, not having been previously recognized, was not found. (See class 4 C, a.) At a follow-up examination two years postoperatively complete recovery was observed.

to rule out damage to short rotator tendons, can scarcely be overemphasized. Operative repair of massive tendinous defects such as these, especially if associated with damage to the axillary nerve, has proved useless in my hands, and I would still advise arthrodesis as a primary procedure when such conditions are found.

B. Laceration or Avulsion of One or More Short Rotator Tendons in Their Substance or at Their Attachments.—I now have 30 cases of this condition. They are classified as follows:

1. Recent avulsion.

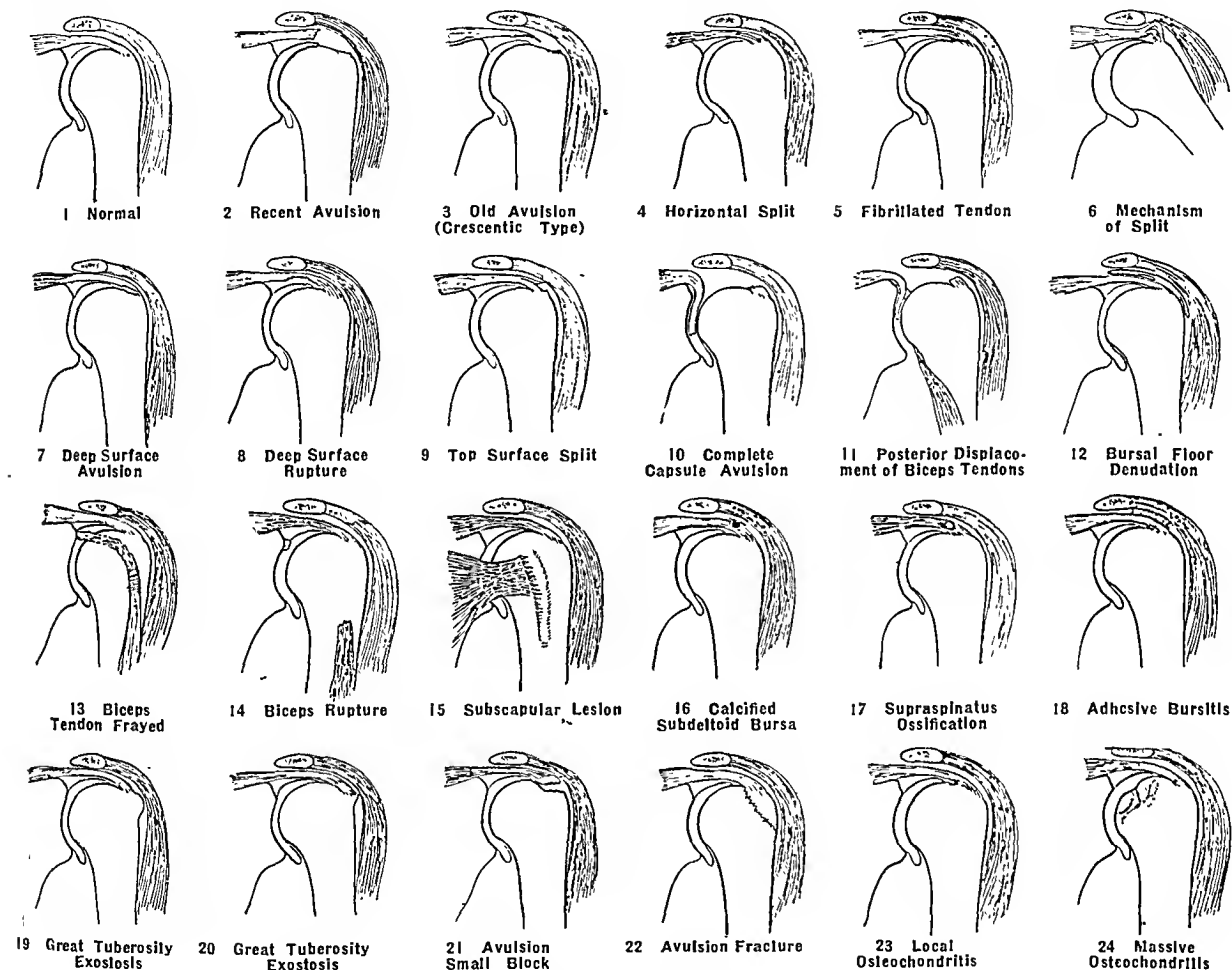


Fig. 1.—Types of lesion found.

2. LESIONS OF TENDONS

A. Complete Avulsion of the Short Rotator Cuff.—There have been only the original 4 patients with complete avulsion of the cuff. The treatment of 3 has been a complete failure, and the fourth, on whom an arthrodesis was done at the original operation, was the only one able to return to a gainful occupation. The typical picture of inability to maintain reduction after dislocation, the head merely being replaced over a tendinous cuff drawn downward across the glenoid cavity, was present. I have noted that 2 patients, both elderly, avulsed the cuff by simple falls on the outstretched arm, but that in 2 others the cuff was completely lacerated by forcible manipulation and reduction of simple dislocation without anesthesia. The importance of securing relaxation and using gentleness in the reduction of dislocation of the shoulder, with subsequent observation

(a) Of deep or superficial surface at insertion, 10 cases.

(b) Of entire thickness of tendons.

(1) Of anterior portion of supraspinatus tendon, 5 cases.

(2) Complete, of tendon or tendons, 8 cases.

(c) With horizontal split, 3 cases.

(d) With fibrillation or fimbriation, 1 case.

(e) Of cortical fragment at supraspinatus insertion, 1 case.

2. Old avulsion (crescentic type), 2 cases.

These lesions have occurred at any age from 17 to 70. The greater number are in men, there having been 21 in men in my series, as compared with 9 in women. In 18 cases the right shoulder was involved, and in 12, the left. Arthritic manifestations were not causative factors in any case. Injury was the universal etiologic

factor—a fall on the outstretched arm, a twist or an unusual lifting strain; in only 1 instance was there reported direct trauma to the shoulder with the arm at the side.

Two patients had both shoulders involved. One of these, previously reported, had accidental hyper-

tissue and other musculature. When demonstrated it was generally associated with massive bursal adhesions, partial tears or the so-called rim rent tears.

The typical picture of a complete laceration of the supraspinatus tendon with or without laceration of other tendons closely paralleled the picture of complete avulsion of the cuff except for the fact that there was no recurrent dislocation. The patient lost all active power of abduction beyond the point at which the greater tuberosity of the humerus impinged against the acromial process, but passive abduction and other motion were complete and practically painless when the head of the humerus was manipulated downward so that impingement did not occur. Localized tenderness, a sulcus, an eminence and demonstrable atrophy might be absent. The arm drop sign, however, was strongly positive.

If one contrasts with complete lacerations the partial laceration, horizontal split, tear of the deep surface and all crescentic types of laceration, one sees an entirely different picture. The patient has considerable spasm and protection, with pain on active or passive motion. There is localized tenderness, often exquisite, but because of protection there is no catch in abduction and there is entire refusal to support the arm; hence there is no arm drop sign.

Definite, specific diagnosis of the lesion to be found cannot always be made preoperatively. The term "internal derangement" should be as applicable to the shoulder as it has become to the knee. From careful study, however, one may be reasonably sure that there are internal pathologic conditions although one cannot with certainty state the minute nature thereof.

From my present follow-up study of the outcome of repair I would again emphasize that after the initial

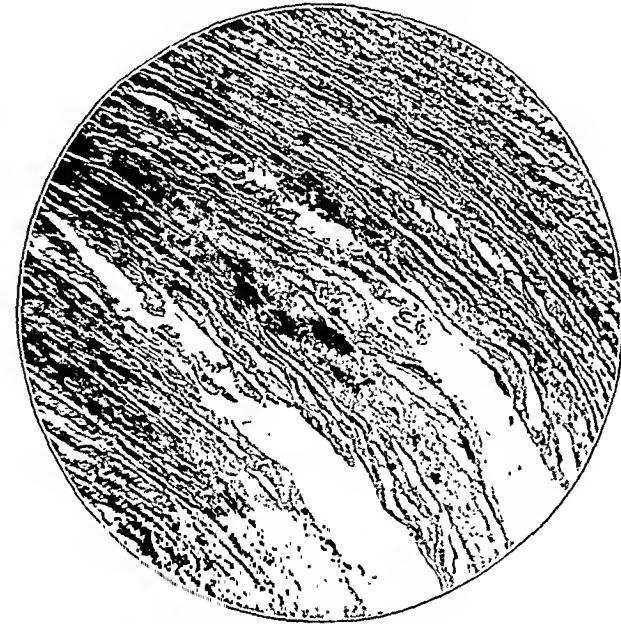


Fig. 2.—Laceration of the supraspinatus tendon. Compare with the lesion, in another patient, shown in figure 3.

extension of both shoulders under anesthesia in my presence. Successful repair of the lesion of the left shoulder was done, and symptoms rapidly disappeared from the right shoulder. The other patient had had trichinosis some years previously and had suffered twisting injuries to each shoulder of an amount which would ordinarily not be expected to result in rotator tendon laceration. Preceding dislocation had occurred in 3 patients: in 1 twelve years previously, in a second four times in the preceding three years and in a third at the time of the original injury, one month before operation.

Symptoms have not consistently denoted the extent of the lesion. Pain, spasm and protection have always been present in some degree. They were more apt to occur with a partial laceration than with complete tears with retraction of the tendons. With the latter, massive loss of power and the so-called arm drop sign were more apt to predominate. The presence of a sulcus or an eminence was an extremely unreliable diagnostic sign. In the only instance in which this could be demonstrated, and in fact was photographed cinematographically, there proved not to be a tendon tear at all. Loss of active motion in all directions depended on spasm and protection from partial tears and on loss of power from complete ones. The range of passive motion was usually complete after complete tears but was limited by pain, spasm and protection after incomplete tears. Bursal adhesions were found frequently after incomplete tears but rarely after complete ones. This is so because after complete tears the bursal floor is retracted by the lacerated tendons and adhesions cannot form. Restriction of abduction of the arm on stooping was frequently associated with incomplete tears but not with complete ones. Atrophy frequently was difficult to demonstrate because of overlying adipose

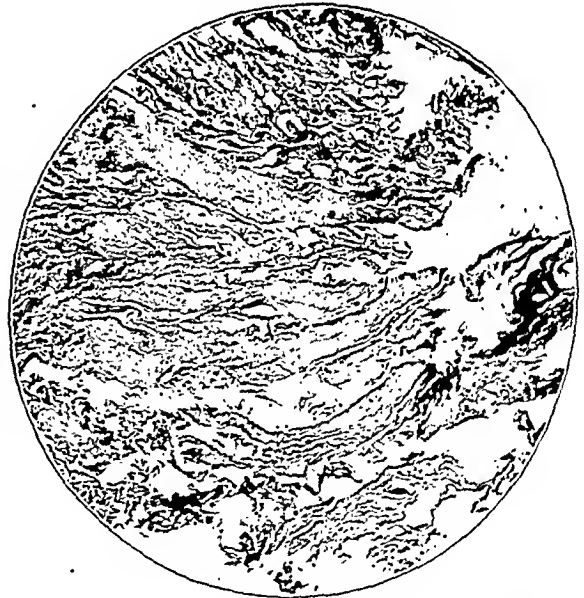


Fig. 3.—Laceration of the supraspinatus tendon with degenerative changes. Once the tendon is torn, lesions of this type do not heal.

injury to a shoulder in which laceration of the rotator tendon is suspected no harm can accrue from a delay in operation of a week or two for observation, to determine whether actual laceration or merely moderate stretching of tissues has been sustained. Throughout the second half of this series such delay has been undertaken in several instances, with the avoidance of

operative repair in a few. I will grant that in some of the latter there may have been minor laceration, but I feel that the speed of recovery without operation justified conservative treatment. If the lesion is suspected, its diagnosis will soon be confirmed and repair can be instituted. When gross symptoms persist beyond

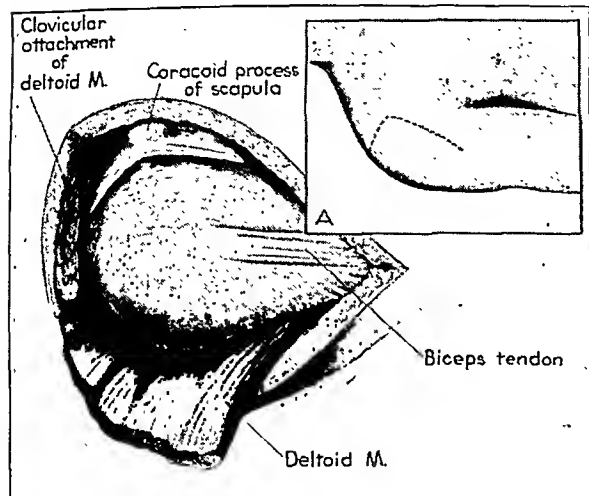


Fig. 4.—Operative repair: turning back the deltoid muscle from its acromial attachment.

two weeks after injury, suggesting major involvement of a short rotator tendon, repair should not be withheld. It has been definitely shown that the supraspinatus and infraspinatus tendons show only further degenerative changes as time progresses after laceration and that repair does not take place under conservative measures (figs. 2 and 3). When recovery takes place after minor tears it does so with wearing and smoothing of torn surfaces, accompanied by permanent degenerative changes.

I would again emphasize that at operation the superficial surface of the tendon may appear normal with a massive avulsion lesion of the deep surface. Exploration should not stop with the bursa but should include the deep surface of the tendon. This can be done through a small incision anterior to the supraspinatus tendon and the passage of a small curved clamp beneath it. If this procedure is carried out, horizontal splits within the tendon substance will likewise not be missed.

Of the 30 patients whose pathologic condition has been presented, 5 were operated on this year, and the results of course are unknown. The progress of the remaining 25 has been followed to the present time, the longest follow-up study lasting eight years and the shortest one year. Nine had perfect range of motion, normal strength, a lack of pain and an absence of symptoms. Two had slight pain but stated that it was present only in bad weather. Two had a slight loss of strength, although both are carrying on at a laborious occupation. Eight had slight restriction of motion amounting to as much as 10 per cent of abduction or rotation. The treatment of 4 has been classified as a failure. One of the 4 had subscapular bursitis, with an end result of gross crepitation on any motion of the scapula. A second re-lacerated a repaired fibrillated tendon. Fusion of the shoulder would undoubtedly have been a better procedure than repair. A third had a rim rent tear of four months' duration, and, although he performs heavy labor, he has a massive defect in motion, without pain. The fourth is the only 1 of the

series who remains severely crippled, with loss of motion, pain, atrophy and spasm. He is completely disabled two years postoperatively. In addition to the lesion of the shoulder, he has conversion hysteria, which perhaps in some part accounts for his disability.

Since all lacerations were made complete at the time of repair, estimations as to the result depending on the completeness of the original tear have not been done. A comparison of cases early in the series in which transplantation was made into mild bony defects with those in which transplantation was done $\frac{3}{4}$ inch (1.9 cm.) or more downward onto the humerus shows no appreciable difference in end results. Recovery seems somewhat slower with radical transplantation. I would therefore suggest that the extent of the tear will control the extensiveness of repair (figs. 4, 5, 6 and 7). As can be seen, results are uniformly excellent except when there are rim rent tears or badly fibrillated tendons or when a neurosis exists.

C. Musculotendinous Separation of the Supraspinatus and Infraspinatus Muscles.—No case of musculotendinous separation has been found other than the 1 originally reported. Treatment of the patient was previously reported as an early failure. On recent examination, three years postoperatively, he was seen to have a full range of motion and 75 per cent strength and to be asymptomatic. The new type of repair, apparently taking up the slack in the tendon, provided a satisfactory outcome.

D. Calcification or Ossification of the Supraspinatus Tendon.—Ossified tendon lesions have been encountered twice associated with calcification, and calcified tendon lesions, in 3 other instances. In each instance symptoms had been present in the shoulder for months to years, with a history of either slow onset or a direct blow on the shoulder. In no case did onset occur after an initial twisting strain, a fall on the outstretched arm or a dislocation. Symptoms varied from moderate discomfort to extreme pain, spasm and protection. This variation depended generally on whether calcified material had been extruded into the bursal sac. In each instance various modalities such as massage, diathermy

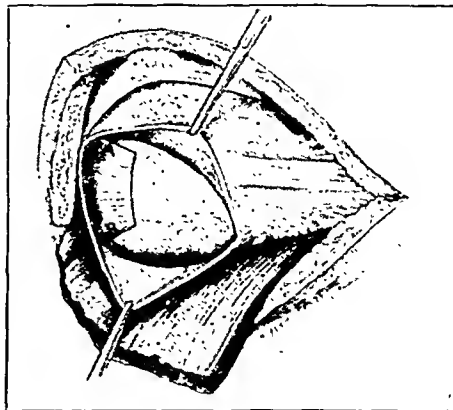


Fig. 5.—Incising the bursal roof.

and attempts at needling and washing of the calcified area or bursa had been carried out. In 1 instance the calcification was associated with laceration. Follow-up observation has been maintained in all 5 cases. One case, in which operation was done less than one month before the time of writing, is too recent for determination of results. In 3 of the other 4, recovery has been

complete and no recurrence of calcification or ossification has ensued. In 1 case of associated laceration there is still slight occasional pain, classed with the results of laceration. The speed of recovery in these cases, even when excision of ossification was done, was much more rapid than that for repair of tendon injuries caused by laceration.

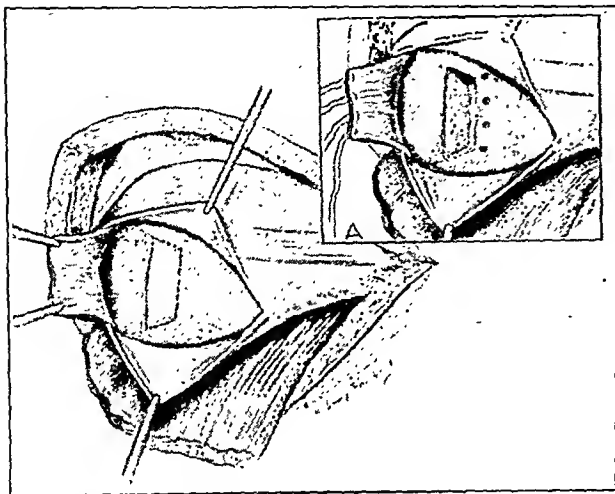


Fig. 6.—Creating a wedge-shaped defect in the area of the greater tuberosity.

E. Lesions of the Subscapularis Tendon (Recurrent Dislocation).—In 3 cases in which the shoulder was radically explored there was recurrent dislocation. Gross stretching of the subscapularis tendon was found but would have been missed had not the shoulder been carefully dissected. In addition to being stretched the tendon was thin throughout the portion proximal to its insertion, slightly yellowish and narrowed from above downward. The appearance was that of fibrous degeneration and repair of long standing following laceration within the tendon substance. In 1 case there was complete avulsion of the muscle and tendon substance from the anterior border of the glenoid cavity and the anterior surface of the scapula in its outer half. It is not known whether this condition was present in the other cases, since it was not looked for. On the basis of the foregoing data I suspect that recurrent dislocation frequently may be associated with stretching or laceration and fibrous repair of the subscapularis tendon plus avulsion from the under surface of the scapula in its outer part and from the rim of the glenoid cavity. In all the cases mentioned repair was by transplantation of the attachment of the subscapularis tendon to a new bony defect created in the humerus $\frac{3}{4}$ inch (1.9 cm.) lateral to the bicipital groove. In 2 there was an associated transplantation of the long head of the biceps. Repair in the other was done without transplantation of the long head of the biceps, as this structure was absent. In 2 cases of transplantation of the subscapularis tendon more than two and one-half years have passed without redislocation. The third case is too recent for follow-up study.

3. BURSAL LESIONS

A. Obliterative Subacromial Bursitis (Frozen Shoulder).—Seven patients with this lesion were operated on. All had previously received extensive conservative treatment. All had a lesion massively obliterated by dense adhesions requiring sharp dissec-

tion throughout most or all of their extent. Adhesions ordinarily were found to be unusually dense about the subscapularis tendon. The course of 2 patients could not be followed. One was treated too recently to be reported on. The 4 others of the 7 show a complete range of motion and complete absence of pain or other symptoms, except that 1 states that in bad weather he still has a twinge of pain. After division of adhesions in the subacromial area and manipulation to stretch or destroy adhesions about the subscapularis tendon, the arm was supported in abduction for an average of six weeks in a plaster spica. Prolonged physical therapy was necessary after release from the plaster.

B. Laceration of the Bursal Floor Without Tendinous Involvement.—This has been observed only once and carried with it symptoms of mild tendon laceration. Replacement of the bursal floor gave rapid relief of symptoms and brought about complete recovery.

4. LESIONS OF BONE

A. Sharp Exostosis at the Tendinous Attachment of the Greater Tuberosity.—The patient with this lesion, previously reported on, who was treated by exostectomy done beneath the periosteum and the bursal floor, has been followed to date and shows complete recovery, although two years ago I granted him a result only 75 per cent satisfactory.

B. Rounded Exostosis on the Greater Tuberosity Associated with Tendon Laceration.—Two patients with lesions of this type have been operated on. The history of initial injury always includes a blow on the shoulder, with a steadily increasing amount of disability generally associated with localized pain and tenderness and a decreasing range of motion. Roentgen examination at first gives negative results. Gradually there develops a calcified shadow over the anterior portion of the upper border of the greater tuberosity, increasing in size and later becoming of osseous density. One patient, observed for three and one-half years, has a 95

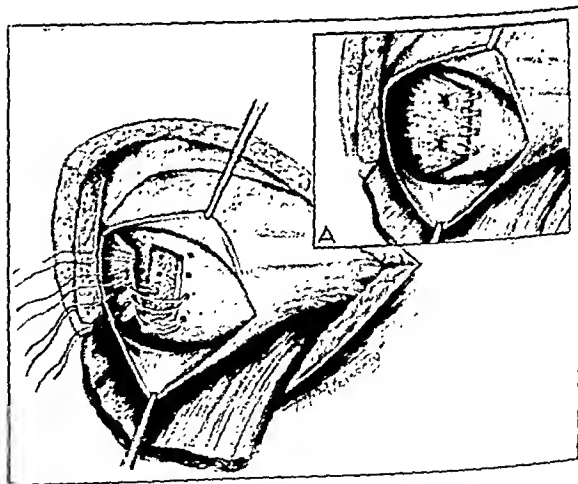


Fig. 7.—Drawing the freed margins of the infraspinatus and supraspinatus tendons down into the defect with four silk sutures.

per cent range of motion at present, is completely asymptomatic and shows no recurrence of exostosis on roentgen examination. The other patient has been operated on within the past month, and it is of course too soon for follow-up study.

C. Osteochondritis.—Osteochondritis has been encountered unsuspectedly in 2 patients whose shoulder-

were massively explored. In 1, a girl of 17 who had been in a severe motorcycle accident, the lesion consisted of a small localized area of cartilaginous and bony defect not more than 0.5 cm. in diameter lying directly under the attachment of the supraspinatus tendon. The patient did not know the actual form of injury received. There was every classic symptom of a tear of the supra-

3. Fusion of the shoulder is indicated when complete avulsion of the tendinous cuff has occurred, massive fibrillation of a tendon is present or old crescentic tears exist.

4. Early osteochondritis of the head of the humerus may present a clinical picture difficult to differentiate from that of laceration of the short rotator tendons.

58 East Sixty-Fifth Street.

ABSTRACT OF DISCUSSION

DR. JOSEPH J. KURLANDER, Cleveland: Best results in the treatment of shoulder disabilities and injuries depend on an accurate diagnosis of the underlying pathologic condition. In the past, most of us have been inclined to be too conservative and not explore the bursa and supraspinatus tendon. The treatment of complete avulsion of the tendons, particularly the short rotators, requires replacement by suture, usually directly to the bone. It is quite possible, however, to secure equally good results by suture of the torn tendons to the surrounding tissues in the immediate locality, that is to the periosteum, capsule or even the under surface of the deltoid with the arm held in abduction. This leads me to wonder whether this treatment isn't just as applicable to a complete avulsion of the shoulder cuff instead of performing an arthrodesis as advocated by Dr. Bosworth. Some believe that calcium deposits originate in the supraspinatus tendon through the calcification of small deposits of blood following fraying or tearing of the tendon, and that this deposit then ruptures into the subdeltoid bursa. Deposits often are visualized in both the tendon and the bursa. Which appeared first, we do not know. Removal of the calcium deposit gives dramatic relief from pain. Pain is also readily relieved by the injection of procaine and needling the tender area. Flushing the bursa with saline solution is also excellent treatment, as is the use of diathermy. Pain is often relieved with the latter modality without a diminution of the calcium, so it is often a question what really causes the pain.

DR. LAURENCE JONES, Kansas City, Mo.: I wish to call attention to a basic point in the question of shoulder joint physiology. The original article was published some eight years ago, but as it was done rather badly one cannot blame the profession for having almost forgotten it. At that time it was thought that the term "short rotators" was a misnomer. Their insertion at the extreme end of the humerus makes rotation a minor fact. In reality these are suspensory muscles attached at three points. In front there is the subscapularis, above is the supraspinatus, and posteriorly the tendinous fusion of two muscles, the teres minor and the infraspinatus. This is a transitional joint in the weight bearing quadruped, but in the human being ordinary function is exactly the opposite, except in "pushing." It has been generally agreed that their major function is to jam the head of the humerus firmly into the joint so that the various stresses and strains of the larger muscles can be performed without dislocation or abnormal movement. The paper was enjoyed greatly but issue was taken with the idea that a shoulder should be arthrodesed as long as the short rotator suspensory muscles can be recovered. Even in rare instances in which fracture dislocations complicated by comminution of the head of the humerus exists, the head can be discarded and the suspensory muscles retained and reimplanted in the shaft. A new head forms, it will stabilize the shoulder function, and in none of my own cases or in cases of other physicians using this technique has dislocation occurred. Many of these cases have been followed for many years.

DR. DAVID M. BOSWORTH, New York: As regards arthrodesis, it depends on what the findings were at operation. Two of these shoulders with complete avulsion of the rotator cuff showed chalky bone, and one could not fasten it back to the bony structure anywhere. The cuff was not long enough to fasten to the soft tissues. Two of them were old cases of avulsion of the cuff, in which the cuff had retracted over a period of four months or a year. It was impossible to get it back satisfactorily in approximation to the point of avulsion. Not only that, but massive fibrosis and loss of bursa itself forecast a poor outcome. In those cases I would advise doing an arthrodesis. As to rotators versus suspensories: I believe that

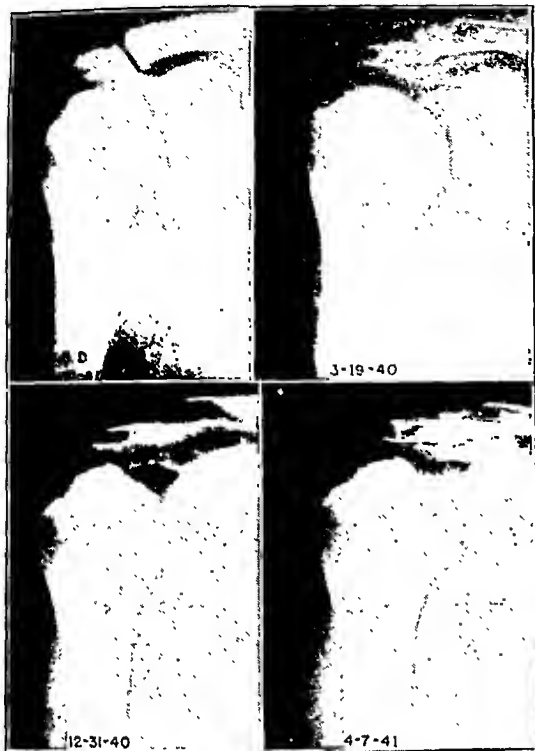


Fig. 8.—Massive osteochondritic changes not noted preoperatively, after exploration at which no pathologic condition was found, continued to progress.

spinatus tendon, including a sulcus and a prominence. At operation the tendon attachments were found normal; the osteochondritic defect was discovered and curetted; its base was drilled, and remarkably rapid recovery ensued. Though less than six months have passed after operation, there is no clinical or symptomatic defect in the shoulder. The other patient has massive osteochondritis involving practically all the articular surface of the humeral head, with faint roentgen evidence thereof which passed unnoticed preoperatively (fig. 8). Disability of the shoulder consisted mainly of loss of motion. There was an indefinite complaint of low grade continuous pain but no catch or arm drop sign. At operation no pathologic condition was found. The gradual progress of the lesion has been followed with roentgenograms. Since the education afforded by this patient, a patient with a similar condition has been observed but of course not operated on.

CONCLUSIONS

1. Radical exploration of the shoulder joint through a division of deltoid fibers close to their attachment to the acromial margin permits thorough inspection for pathologic conditions and carries with it no permanent defect so far as deltoid function is concerned.

2. The results of repair of laceration of the supraspinatus and infraspinatus tendons by transplantation can give a high percentage of success.

these tendons are rotator tendons. They rotate the head of the humerus and the rest of the upper extremity. If you will notice, there is no space between the supraspinatus and the infraspinatus at their attachment. There is a good space between the subscapularis anteriorly and the supraspinatus as well as the teres minor posteriorly and the infraspinatus. So I would group them from a three point angle. Again I would do that because in the supraspinatus and infraspinatus tendons the approximation of the head of the humerus to the under surface of the acromion process by its jamming action inhibits blood supply and repair, whereas I specifically stated that repair does occur in the tendon, anteriorly the subscapularis and posteriorly the teres minor.

TRICHINOSIS

REPORT OF NINETEEN CASES OF CLINICAL INFECTION AND TWENTY-ONE CASES OF ASYMPTOMATIC INFECTION

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Trichinosis, in spite of the fact that it is so old that it was known to the ancients, has assumed new interest in the light of many recent publications on the disease. This particular interest at present probably is the result of two factors: First, it has been claimed that in many cases trichinosis is undiagnosed by physicians and, second, it has been declared that the principal cause of the supposed increase in incidence of the disease is the ingestion by persons of meat from hogs fed on raw garbage. The first conception has been acquired through the numerous published results of routine necropsy performed at various public and private hospitals in the United States. These examinations have revealed that the percentage of infection varies from 3 to 28, depending on the geographic sector in which examinations are made.

What has not been sufficiently stressed, however, is the consideration that the percentage of infection has been determined only after examination of large quantities of those muscles (and in particular the diaphragm) which are most likely to become invaded by *Trichinella spiralis*. In most instances the infection has been light, and in the majority of cases only a few larvae have been discovered in the entire material examined.

What has not been sufficiently emphasized, further, is the fact that almost without exception the persons concerned in such examinations had, during life, no signs or symptoms of clinical trichinosis, and hence it must be concluded that the condition found in such investigations represented asymptomatic infection which has no significance from a clinical standpoint, unless it is that once a person is infected he or she becomes immune. If this were true, infection of such slight degree might be considered "a blessing in disguise." That such a condition of acquired immunity is not merely theoretical is attested by the experiments of McCoy,¹ as well as by other experiments conducted in laboratories at the Mayo Clinic, where it has been shown that once animals are infected it is usually impossible for them to become reinfected.

From the Division of Medicine (Dr. Tillisch) and the Division of Clinical Pathology, Section on Parasitology (Dr. Magath), the Mayo Clinic.

1. McCoy, O. R.: Immunity of Rats to Reinfection with *Trichinella spiralis*. *Am. J. Hyg.* 14: 484-494 (Sept.) 1931.

ASYMPTOMATIC AND CLINICAL INFECTION

The fundamental difference between clinical and asymptomatic infection with *T. spiralis* should be apparent to all. Frequently the physician is unable to diagnose typhoid when a carrier originally becomes infected, and, similarly, the physician usually is unable to diagnose trichinosis at the time the "carrier" originally becomes infected by a few trichinous cysts. Nothing in particular would be gained by the ready diagnosis of asymptomatic trichinosis, and in fact it cannot be diagnosed clinically. Even if resort is made to the cutaneous test, the diagnosis still is uncertain. To perform a biopsy on each suspected person in order to establish the validity of the diagnosis would, of course, be ridiculous.

It has been the practice of certain nonmedical writers to take physicians to task for being unable to diagnose trichinosis, and these writers have maintained that the disease, instead of following the classic picture, frequently assumes a bizarre form. What these authors have failed to understand is that all the symptoms which the patient might have had at any time before death were not necessarily attributable to trichinosis simply because a few trichinae, thoroughly encysted, were found in the diaphragm of these patients at death. In fact, such thoroughly encysted trichinae may not have caused any symptoms at all of trichinosis per se. Although physicians may at times be vulnerable to attack for failure to diagnose more or less uncommon diseases, there is no real evidence to support the contention that the classic picture of trichinosis has changed since it was first established, and it seems unlikely, on the basis of information at hand, that clinical trichinosis (as opposed to asymptomatic trichinosis) is so frequently overlooked that an infinitely larger number of instances of the disease occurs than is diagnosed.

CAUSATIVE FACTORS IN THE INCIDENCE OF TRICHINOSIS

As far as the feeding of raw garbage to hogs is concerned, evidence is not yet at hand to justify conclusions as sweeping as those some investigators have drawn concerning the effects of such a practice in relation to the incidence of trichinosis. One of us (Magath) pointed out some years ago that the commonly accepted explanation of the transmission of *T. spiralis* from hog to hog by the agency of the rat could not explain the incidence of trichinosis found in hogs, and there is no question of the fact that the feeding of raw garbage to hogs does, to some extent, explain a part of the incidence of trichinosis. It has been shown beyond doubt that hogs fed on raw garbage in certain cities have a higher percentage of trichinosis than those not fed garbage in other parts of the country or than those fed cooked garbage. Yet such an observation does not entirely explain the epidemiology of trichinosis. All investigators have found that an appreciable percentage of hogs which have never been fed garbage are infected, and although the incidence of trichinosis in man might be reduced by the elimination of raw garbage as hogs' food, there would still be an appreciable percentage of hogs infected with *T. spiralis* coming to slaughter houses if garbage were not fed to them.

SYMPTOMS AND CLINICAL OBSERVATIONS

The symptoms and observations in a case of trichinosis vary somewhat according to the degree of infection present and the resistance of the host. The classic

picture of the disease, which is generally taught, consists of onset of from a few hours to a few days after the ingestion of the infected meat, with gastrointestinal symptoms of anorexia, nausea, vomiting, abdominal cramps and diarrhea. These symptoms are undoubtedly referable to the presence of the parasites in the digestive tract. They represent the first stage of the disease and may persist until the second week, which is the period of invasion, or the second stage. During the second stage the organism is in the blood stream and is invading the organs. Various toxic symptoms are present. Fever usually is present and may endure for a few days to six or seven weeks and may be of varying intensity. Other symptoms of a toxic state, such as chills, anorexia, lassitude, headache and weakness, often are present. Various embolic or allergic manifestations appear frequently, such as edema of the eyelids with chemosis and conjunctivitis. Various cutaneous lesions (which simulate rose spots) and subconjunctival hemorrhage may be present. Invasion of muscles is accompanied by stiffness, tenderness, pain and swelling of the muscles, at times associated with pain and difficulty in chewing, swallowing or breathing. Dyspnea may be severe as a result of diaphragmatic involvement. Other muscles, especially the flexors, usually show symptoms of involvement. The third stage, or the period of encystment of the larvae, usually begins in about six weeks and in more serious instances is characterized by anemia and emaciation. Recovery may be protracted, or the patient may succumb to some intercurrent infection such as pneumonia. Total recovery may not take place for several months after the original infection, or death may even occur during the height of the disease in the second stage. In 320 cases in which patients were observed from 1909 to 1914, Ransom² found that the rate of mortality was 6 per cent, and in 1,550 cases reported in the United States the rate was 16 per cent.

Among the less common or more unusual symptoms, constipation or, even more rarely, intestinal hemorrhage may be present during the first stage, the stage in which gastrointestinal symptoms appear.

During the stage of invasion certain manifestations in the central nervous system may develop. These are not so uncommon as is generally believed. Several cases have been reported in which the larvae of *T. spiralis* were found in the central nervous system and in the spinal fluid. Evers³ reported a case in which the picture of toxic encephalitis and neuroretinitis was present and in which larvae were found in the spinal fluid. The patient recovered. In reviewing the literature, he found that 24 cases had been reported in which larvae were found in the spinal fluid, and he wrote that manifestations in the nervous system may not be present even in cases in which larvae are found in the spinal fluid.

Until recent years little attention has been paid to cardiovascular involvement in trichinosis, although Zenker observed the larvae in the cardiac muscle of a patient who died of the disease in 1860. Spink⁴ reported 6 of 18 cases of trichinosis in which electrocardiographic changes were present, and he recorded the observations made at necropsy performed on a patient

with myocarditis. The symptoms and observations of myocarditis caused by trichinosis do not vary from the symptoms of other forms of acute myocarditis.

In reference to other cardiovascular complications, Cheney⁵ first reported a case in which extreme hypotension was present, and Spink and Augustine⁶ found hypotension in 12 of 35 cases in which the systolic pressure was less than 100 mm. of mercury. Thrombosis and infarction may occur, and pulmonary, gastrointestinal and retinal hemorrhages are sometimes seen. McNaught⁷ called attention to the presence of "splinter hemorrhages," which are sometimes seen beneath the nails of patients during the period of invasion; they probably represent an embolic manifestation.

The urinary organs seldom are involved, and albumin and casts, as sometimes observed in the urine of a patient, probably represent toxic changes.

Cutaneous manifestations more often are absent than present and may appear as a rose spot rash, scarlatiniform rash or erythema multiforme. The spleen may be enlarged. Other symptoms occasionally found include cough, signs of pneumonia and pleural effusion, vertigo and tinnitus.

DIAGNOSIS

Trichinosis must be considered as one of the possible clinical diagnoses in many cases in which the patient's condition is obscure, in view of the incidence and possible varying symptoms of the condition. A history of ingestion of raw or poorly cooked pork in the recent past and the presence of a similar illness among other members of the patient's family or community are important steps in the making of a diagnosis of the disease. The presence of certain typical symptoms, such as fever with edema of the face and eyes or muscular pains with a history of a "stomach upset" a few days before, often suggests the diagnosis. In the presence of eosinophilia, with more or less typical symptoms, the possibility of trichinosis always should be considered until it has been ruled out. Certain laboratory tests aid in the confirmation of clinical impressions; however, results of examination of the stools and blood for larvae usually are disappointing. The reliability of the cutaneous test to date is uncertain, although some investigators have reported a remarkably high value for this test. Schapiro, Crosby and Sickler⁸ found the test of value in 78.9 per cent of cases in which the condition later was found to be present and in 97.8 per cent of cases in which the condition later was found not to be present. The presence or absence of the disease was proved by observation at necropsy. In 400 cases of routine necropsy, Schapiro, Crosby and Sickler found that the reaction to the cutaneous test during the lives of the patients had been positive in 18.25 per cent; the cutaneous test had failed to detect the presence of the parasite in 2 instances, and of 73 cases in which a positive reaction to the test had been obtained there was in 3 no evidence of trichinosis at necropsy. False positive reactions and false negative reactions exist; the reaction to the test becomes positive in about the second week of the disease, and a positive reaction to the test can be obtained from patients years

5. Cheney, Garnett: Sporadic Trichinosis with Exereme Hypotension, *J. A. M. A.* 86: 1004 (April 3) 1926.

6. Spink, W. W., and Augustine, D. L.: The Diagnosis of Trichinosis, with Special Reference to Skin and Precipitin Tests, *J. A. M. A.* 104: 1801-1805 (May 18) 1935.

7. McNaught, J. B.: The Diagnosis of Trichinosis, *Am. J. Trop. Med.* 19: 181-192 (March) 1939.

8. Schapiro, M. M.; Crosby, B. L., and Sickler, Margaret M.: The Correlation of Clinical Diagnosis and Postmortem Findings in Trichinosis, *J. Lab. & Clin. Med.* 23: 681-687 (April) 1938.

2. Ransom, cited by Anderson, A. W.: Report of Forty-Six Cases of Trichinosis, *Nebraska M. J.* 19: 379-382 (Oct.) 1934.

3. Evers, L. B.: Manifestations of Trichinosis in the Central Nervous System: Report of a Case with Larvae in the Spinal Fluid, *Arch. Int. Med.* 63: 949-956 (May) 1939.

4. Spink, W. W.: Cardiovascular Complications of Trichinosis, *Arch. Int. Med.* 56: 238-249 (Aug.) 1935.

after infection has taken place. The blood precipitin test, although confirmatory, seems to be less reliable than the cutaneous test. Positive results of biopsy on muscle constitute conclusive evidence of the disease. The specimen should be examined by the press preparation method and not sectioned. Negative results of biopsy do not entirely exclude the presence of the disease, for in its early stages, before the arrival or encystment of larvae in the muscles, it is not possible to detect evidences of it in the muscles, and in other cases the specimens for biopsy must be obtained from muscle most likely to harbor the parasite. At the Mayo Clinic it has been found that the pectoralis major muscle in that portion of it which lies in the anterior axillary line is the most reliable site for the detection of possible infection, although in the presence of a light infection, or if only superficial search is made, results of biopsy of sections from this site may be falsely negative. Rarely is the opportunity at hand to obtain sufficiently large specimens to make use of digestive methods of search for the parasite.

Patients may present one or more of the numerous symptoms, with other symptoms either absent or seem-

TABLE 1.—*Trichinosis: Symptoms and Observations in Nineteen Cases of Clinical Infection*

Symptom	Number	Percentage
General toxic	17	89
Fever	14	74
Chills	3	16
Headache	5	26
Muscular pains	17	89
Gastrointestinal	12	63
Edema	13	68
Face	13	68
Elsewhere	4	21
Ocular	10	53
Cutaneous manifestations	4	21
Central nervous system	2	11
Respiratory	2	11
Cardiovascular	0	0
Epistaxis	1	5
Menstrual	1	5
Significant loss of weight	2	11

ingly insignificant. Patients may be encountered who have gastrointestinal symptoms during the first stage of the disease, at which time an interesting and difficult diagnostic problem is presented. On the other hand, gastrointestinal symptoms often are absent throughout the entire course of the disease. Frequently muscular aches and pains are outstanding; again, only fever seemingly is present, in which case it is exceedingly difficult to arrive at the correct diagnosis. Patients often are seen first by ophthalmologists because in some cases ocular symptoms are predominant; in other cases the otorhinologist sees the patient because the patient complains of headache and edema of the face. Cardiac, meningeal or cerebral symptoms may obscure the entire picture. When eosinophilia is present, trichinosis must be considered, but the physician must also consider various allergic conditions, angioneurotic edema, familial eosinophilia, periarteritis nodosa and leukemia. The diseases more commonly mistaken for trichinosis are influenza, rheumatic fever or arthritis, fibrositis, sinusitis, typhoid, acute nephritis and angioneurotic edema. Many others could be included.

ANALYSIS OF CASES

In 40 sporadic cases in which the diagnosis of trichinosis was made at the Mayo Clinic, exclusive of those in which the diagnosis was made at necropsy, the

diagnosis was proved by positive results from biopsy of specimens of muscle or by a typical clinical history and symptoms and in a few instances by the support of a positive reaction to the cutaneous test.

Asymptomatic Infection.—Of the 40 cases mentioned, the diagnosis was made incidentally in 21 during routine examination of surgical pathologic material, and in none of these 21 cases had illness referable to trichinosis been suggested at any time previously. In 12 cases the parasite was found in muscle during routine examination of tonsils, in 2 it was found during examination of thyroid tissue, in 4 it was found during examination of tissue from the lips, in 1 in a mass in the biceps, in 1 in a specimen of lumbar muscle removed at nephrectomy and in 1 in muscle overlying a cyst of the jaw. These evidently represented asymptomatic infection only.

Clinical Infection.—In the remaining 19 cases, the patients came to the clinic with trichinosis as the cause of their symptoms. The average age of the patients was 38; the youngest was 15 and the oldest was 63. Distribution by sex was approximately equal: 9 patients were males, and 10 were females. All but 1 had been born in the United States, and the majority lived in the Middle West. Seven patients were housewives, 3 were farmers, 3 held executive positions, 2 were students, 1 was a physician, 1 was a laborer and 1 was a mail carrier.

Specific Complaints: For 5 patients the immediate complaint referred to the gastrointestinal tract; usually it was diarrhea. Three complained more of generalized aches and pains; 3 complained of ocular edema, and 2 others had first sought medical advice because of ocular symptoms, namely pain in the eyes and the sensation expressed as "tired eyes" respectively. Three complained chiefly of toxic symptoms such as fever, weakness and headache, and 1 had swollen legs. Two patients in this series of 19 presented other complaints not referable to trichinosis: 1 had a hernia and 1 had a corneal ulcer.

Eleven of the 19 patients who had clinical infection gave a history of ingestion of poorly cooked pork a short time before the onset of the illness. Five patients stated that other persons living in the same locality had symptoms similar to theirs.

General Complaints: The most common symptoms of the group were those of general toxemia, with fever, chills, perspiration, weakness, malaise or headache (table 1). Seventeen patients presented one or more of these symptoms: 14 had fever of varying degree at one time or another, only 3 gave a history of chills and 5 complained of headache. Other common symptoms were muscular pains and tenderness, complained of by 17 patients. These pains were usually general, although they were more severe in the muscles of the extremities and the back of the neck. Gastrointestinal symptoms were complained of by 12 patients, diarrhea by 8, nausea or vomiting by 6 and abdominal pain by 3. Thirteen patients had edema of the face or eyes, and 4 of these also complained of edema elsewhere: 2 of swelling of the neck, 1 of swelling of the hands, and 1 of swelling of the ankles.

Ocular symptoms other than orbital edema were found in 10 cases in this group of 19. These included photophobia, difficulty in focusing, pain in the eyes, pain on movement of the eyes, "tiredness" of the eyes and dimness of vision. One patient presented a subconjunctival hemorrhage and 1 had a retinal hemor-

rhage. One patient complained of diplopia when his eyes were tired, and his wife had noticed that he had strabismus on numerous occasions.

Only 4 patients exhibited any kind of cutaneous manifestations. One had an itching rash of the forearms and feet, 1 presented desquamation of the skin of the arms and legs, 1 had "hypersensitive" skin and 1 had general pruritus.

Involvement of the central nervous system was rare in the group of 19 cases of clinical infection. It was found in only 2 cases. One patient, encountered in the chronic stage of the disease, stated that he had been left with weakness of the right side of his body and had difficulty in walking and writing because of this weakness. His bank had refused to accept his checks because his signature had changed until he explained the situation. At the time of examination nothing was found regarding the hemiparesis. One patient presented severe stiffness and soreness of the muscles of the neck and severe vertigo with repeated vomiting. Acute otitis media had developed, however, and the patient's vestibular symptoms may well have been referable to this condition. It is interesting that this patient's condition had first been diagnosed as "encephalitis" and also that the results of examination of the spinal fluid were negative.

Two of the 19 patients who had clinical infection had respiratory symptoms; 1 of these had a persistent cough. Two had basal pulmonary rales and 1 had mild dyspnea and discomfort on deep breathing. No cardiac manifestations were found in the present series. One patient had a bloody nasal discharge and hematemesis; 2 had significant losses in weight, 1 losing 70 pounds (31.8 Kg.) in one month of illness. One patient suffered from hypomenorrhea on one occasion. Examination of the urine of 1 patient who had considerable frequency of urination gave only minimal results. There was no mortality in this group.

Reinfection: Two of the series of 19 patients with clinical infection serve to raise the question of repeated infection. Such an occurrence would be difficult to prove, because we saw the 2 patients concerned on only one occasion. In both instances the diagnosis was made by means of the clinical picture, the presence of eosinophilia and positive results of a biopsy of specimens of muscle. One of the 2 patients was a woman aged 38, a physician, who complained of fever, malaise, muscular aches and orbital edema. She had had identical symptoms on six different occasions during the ten years prior to her coming to the clinic. Results of examination of the urine had always been negative. The second patient, a woman aged 30, complained of generalized muscular aching, orbital edema and fever that had appeared intermittently during the five years prior to her coming to the clinic. She gave a history of having eaten large amounts of pork.

Laboratory Observations: The highest total leukocyte count in this series of cases was 40,000 per cubic millimeter of blood, obtained in 2 cases; the lowest was 6,100 per cubic millimeter of blood. In 10 cases there was a total leukocyte count of 10,000 per cubic millimeter of blood or less. The significance of this will be considered later in this paper. A differential count was obtained in 18 of the 19 cases of clinical infection (table 2), and the highest eosinophil count was 63 per cent, the lowest being 12 per cent. In the greatest number of cases (8) the eosinophil count was distributed between 30 per cent and 50 per cent; in 7 cases

it was distributed between 10 per cent and 30 per cent, as indicated in table 2. The total erythrocyte count and hemoglobin content were of no significance. In a few cases there was a mild degree of secondary anemia.

In 7 cases there was albuminuria of grade 1 plus, and in 1 albuminuria of grade 1 to 2 plus. The results of other laboratory studies, except those of the cutaneous test and of biopsies of muscle, were of no significance.

Cutaneous tests were made in only 3 cases, and the results in each case were positive. In 2 cases positive results were obtained with a dilution of 1:10,000; in 1 case positive results were obtained with a dilution of 1:1,000. The latter case was later proved to be an instance of trichinosis by a biopsy done on muscle. In 1 case a cutaneous test was made three years after infection and the reaction was negative.

A biopsy on muscle was performed in 10 of the 19 cases of clinical infection. A positive result was obtained in 8 of the 10; in 1 other case acute myositis was present. One specimen of tissue obtained from the sternomastoid muscle and studied only by the section method apparently contained no evidence of *T. spiralis*. In this case and in the case of acute myositis, the clinical picture was sufficiently typical to permit a positive

TABLE 2.—*Trichinosis: Eosinophil Determination in Eighteen of Nineteen Cases of Clinical Infection.*

Determination, Percentage	Number of Cases
60 to 70.....	1
50 to 60.....	2
40 to 50.....	4
30 to 40.....	4
20 to 30.....	2
10 to 20.....	5
0 to 10.....	0

diagnosis to be made. In 1 case negative results were obtained when a biopsy was done on tissue taken from the calf muscle, but positive results were obtained when tissue from the pectoralis major muscle was subjected to biopsy. In the majority of cases specimens for biopsy were taken from the pectoralis major muscle, in the anterior axillary line.

Diagnostic Considerations: In the majority of the 19 cases of clinical infection the presence of eosinophilia was the greatest single factor to suggest the correct diagnosis. In a few cases (6) the diagnosis was suggested before the return of the differential blood cell count. A study of the original diagnosis in these 19 cases is interesting. It had been made by either the referring physician or the physician in the Mayo Clinic who originally saw the patient. Among such diagnoses trichinosis was mentioned six times, nephritis was noted twice, indeterminate diarrhea was recorded twice, unstated infectious processes were mentioned twice and conjunctivitis, sinusitis, traumatic headache, secondary anemia, encephalitis, neurosis and migraine were noted once each.

COMMENT

Asymptomatic Infection.—In 21 cases of asymptomatic infection in which the causative organism of trichinosis was discovered during routine examination of surgical pathologic material, the same principle was present as that which is present in routine examination of tissue at necropsy. In none of these cases could the diagnosis of trichinosis as a previous illness be made

before or after the examination. Therefore, the infection must have been accompanied by few, if any, symptoms, or it must have been decidedly atypical. The extremely high incidence of positive results obtained at necropsy at first seems alarming, especially in view of the few instances in which trichinosis was diagnosed clinically; but on further analysis it would be found that the majority of patients probably had had few or no symptoms, and in such circumstances the diagnosis of illness itself would be impossible. Certainly, making the diagnosis of trichinosis would be unjustified. The infective condition in these cases has been called "asymptomatic infection" as differing from "clinical infection." In many respects asymptomatic infection is similar to primary pulmonary tuberculous infection, which also is seldom clinically diagnosed but is often discovered by a Ghon lesion which is visualized in roentgenograms of the thorax or which is revealed by the reaction to the tuberculin test. Nevertheless, the high incidence of the disease as demonstrated in cadavers stresses the need for consideration of improved public health control and education of the people.

Clinical Infection.—The symptomatologic aspects and the observations made in the 19 cases of clinical infection in this series need little comment. The more classic symptoms predominated, although cutaneous manifestations were few. A reasonable number of more "unusual" symptoms was presented, but no cardiac manifestations were found.

The total leukocyte count was normal in about half of the cases, probably because a few of the patients were first referred to the clinic after the most acute symptoms of the disease had subsided. All patients who had clinical infection presented eosinophilia, which persisted longer than leukocytosis.

In the 2 cases in this series in which reinfection was suggested, the question of acquired immunity in man is raised. A few cases of second and third infection have been reported, and recently Kaufman⁹ and Lehrfeld and Breisacher¹⁰ presented cases of second infection. The presence of immunity in man is only suggested by experimental studies with animals. The degree of immunity apparently may decrease with the passage of time. Rats seem to have a degree of natural immunity, and Roth¹¹ showed that partial immunity may be acquired in the more susceptible guinea pig. However, McCoy's¹² attempts to demonstrate similar immunity in 12 monkeys were not uniformly successful, although in 5 there was some evidence of partial immunity.

SUMMARY AND CONCLUSIONS

In an analysis of 19 cases of clinical trichinosis and 21 cases of asymptomatic infection incidental diagnoses were made during routine examination of surgical pathologic material. Included in the series are 2 cases suggestive of repeated infection.

Asymptomatic infection with *T. spiralis* and clinical trichinosis are two conditions which should be clearly separated.

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THE INTRAVENOUS USE OF VITAMIN K

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The intravenous use of a vitamin K active substance in prothrombin deficient patients was first reported by Smith, Ziffren, Owen and Hoffman¹ in 1939. Phthiocol (2-methyl-3-hydroxy-1, 4-naphthoquinone), synthesized by Anderson and Newman² sixteen years earlier, was used. Forty-five cc. of a 0.2 per cent solution given in divided doses was sufficient to raise the prothrombin level in 1 case from 39 to 75 per cent in twenty-four hours. In other cases it was found effective in doses of 40 to 100 mg.³ No toxic effects were observed.

Subsequently Butt, Snell and Osterberg⁴ reported the effective administration of the same material in 9 cases of hypoprothrombinemia. They found that a dose of 25 mg. was not adequate but that 50 mg. brought the prothrombin to a safe level. Later, Butt, Snell, Osterberg and Bollman⁵ found that 1,4-dehydroxy-2-methyl-3-naphthaldehyde was effective in 8 cases in which the material was given intravenously in doses as small as 10 mg. A compound whose exact composition was not known but was "thought to be a sodium salt of 3-sulfonic acid of 2-methyl-1,4-naphthoquinone" was effectively used intravenously in 9 cases. Menadione (2-methyl-1,4-naphthoquinone) was also "administered intravenously in doses of 1 mg. suspended in sterile, physiologic solution of sodium chloride. It was effective in the few instances in which it was tried in reducing the elevated prothrombin clotting time."

Dam, Tage-Hansen and Plum⁶ administered emulsions of vitamin K₁ to 2 infants showing hypoprothrombinemia. The prothrombin level of 1 came to normal after this treatment, and of the other, who had icterus neonatorum, "the blood picture improved slowly." The authors say "When one compares the patient's blood regeneration with that of his twin brother, who was not treated with vitamin K, it appears as though the improvement was independent of the treatment."

INDICATIONS

The cases in which the intravenous administration of vitamin K is indicated fall into three main groups:

The first group includes cases in which the preparation cannot be given orally, particularly after operations when, because of nausea, some patients cannot retain the material. Fat-soluble preparations in cases of obstructive jaundice require the administration of bile or related materials, and these often result in gastric irritation or contribute to nausea already present. The vitamin is rapidly absorbed, however, and if it can

From the Department of Surgery, Rush Medical College.

Dr. H. P. Smith and his associates at Iowa City gave help and suggestions in the use of their two stage prothrombin determination in this laboratory and in the intravenous use of certain of the synthetic compounds.

1. Smith, H. P.; Ziffren, S. E.; Owen, C. A., and Hoffman, G. R.: Clinical and Experimental Studies on Vitamin K, *J. A. M. A.* **113**:329-383 (July 29) 1939.

2. Anderson, R. J., and Newman, M. S.: The Synthesis of Phthiocol, the Pigment of the Human Tubercle Bacillus, *J. Biol. Chem.* **103**:403-412 (Dec.) 1933.

3. Cited by Brinkhous, K. M.: Plasma Prothrombin: Vitamin K, *Medicine* **19**:329-416 (Sept.) 1940.

4. Butt, H. R.; Snell, A. M., and Osterberg, A. E.: Phthiocol: Its Therapeutic Effect in the Treatment of Hypoprothrombinemia Associated with Jaundice: A Preliminary Report, *Proc. Staff Meet., Mayo Clin.* **14**:497-502 (Aug. 9) 1939.

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be retained for thirty minutes the depressed prothrombin will often rise to a safe level.

The second group includes cases in which the vitamin is poorly absorbed from the gastrointestinal tract. Cirrhosis of the liver with hepatic insufficiency, often accompanied by cardiac insufficiency, ascites and edema of the bowel, is one of the best examples of this type of case. Cases of chronic diarrhea, intestinal fistula and ulcerative colitis usually respond to the oral administration of the vitamin, but in occasional cases its parenteral use will be required to bring the prothrombin level to normal or near normal.

The third main group includes those cases in which the response of a damaged liver to vitamin K is to be used as a measure of hepatic function. In such cases it is desirable to control the exact amount of material that gets into the blood stream. This is a study in itself and will be discussed in a separate report.

PREPARATIONS AND METHODS USED

Since MacCorquodale and his associates,⁷ Almquist and Klose,⁸ and Feiser⁹ almost simultaneously reported the structure of an active antihemorrhagic principle in alfalfa to be 2-methyl-3-phytyl-1, 4-naphthoquinone (vitamin K₁), a number of related compounds have been synthesized and studied for vitamin K activity. Of these, the most active studied up to the present would appear to be menadione (2-methyl-1, 4-naphthoquinone),¹⁰ even more active than the original vitamin K₁. It is being used orally in cases of hypoprothrombinemia but has been considered too insoluble to be of practical use intravenously.

In this study, a number of different clinical conditions showing hypoprothrombinemia were included, those of obstructive jaundice predominating. Prothrombin levels were determined by the quantitative two stage method of Warner, Brinkhous and Smith,¹¹ which has a usual error of 3 per cent or less. On days when the atmospheric temperature is higher than 95 F. the error may go as high as 9 per cent. Determinations made on such days have not been included here.

Five different intravenous preparations were studied, and from the accompanying table it can be seen that all the compounds showed vitamin K activity. Patients with severe damage to the liver, such as cirrhosis, did not respond well to any of the preparations. The relative potency of the various materials was not studied, but rather an attempt was made to give more than adequate doses to determine the clinical effectiveness of the compounds. The results would indicate that 4-amino-2-methyl naphthol hydrochloride, 2-methyl-1, 4-naphthohydroquinone 3 sodium sulfonate, 2-methyl-1, 4-dihydroxynaphthalene diphosphoric acid ester tetra sodium salt and menadione¹² may be of practical clinical

use. Two of the 3 patients receiving phthiocol¹³ were suffering from severe hepatic damage, and results from this study as to the drug's vitamin K activity are inconclusive. The reports of Smith, Ziffren, Owen and Hoffman¹ and of Butt, Snell and Osterberg⁴ indicated that the effective dose is rather large for its practical use, particularly since related compounds are effective in smaller doses.

Menadione has been considered too insoluble to be of use clinically by the intravenous route. The potency of the material in solution is significantly impaired by sterilization with steam at 15 pounds pressure for thirty minutes.¹⁴ We have prepared a 0.01 per cent solution in quadruple distilled water, heated for twenty-five minutes in a boiling water bath to insure sterility. The crystals go into solution during the first few minutes of heating, and subsequent variations in temperature down to -35 C. do not precipitate the crystals. A 0.02 per cent solution may be similarly prepared and is stable over long periods if kept under negative pressure at room temperature. At atmospheric pressure it is stable if kept at not below 30 C. In this more concentrated solution the material may precipitate as crystals when kept at room temperature and atmospheric pressure. For general clinical use the 0.01 per cent solution is preferred. Both concentrations have been used for the past twenty months with results shown in the accompanying table. Doses as small as 0.1 mg. have been followed by an elevation of prothrombin levels to normal. The average minimum effective dose for patients with lowered prothrombin levels and comparatively normal liver function is yet to be determined.

A number of workers¹⁵ have reported the instability of the vitamin K active principle on exposure to light, and our studies have confirmed this. Exposure of a solution of menadione to sunlight for fifteen minutes or less or to ordinary laboratory light for two days results in a clouding of the solution.

ROLE OF BILE SALTS

Warner and Flynn¹⁴ have shown that water-soluble vitamin K active compounds are effectively absorbed from the gastrointestinal tract of rats rendered hypoprothrombinemic by ligation of the common bile duct. Smith and Owen¹⁶ demonstrated the utilization of similar substances in cases of obstructive jaundice presenting lowered prothrombin levels. In none of the cases were bile salts or bile given. These results support the conception that the chief role of bile or of bile salts is to render the fat-soluble preparations of vitamin K available to the intestinal mucosa for proper absorption. In our cases bile salts were not given orally in conjunction with the intravenous injections of the vitamin K active substances, and the results would indicate that they were unnecessary. Several patients with cirrhosis received daily doses (except on Sundays) of the sodium salt of dehydrocholic acid (decholin sodium¹⁷) over a period of three months, along with vitamin K given intravenously. No additional rise in prothrombin levels was found. This study will be reported at a later date. In this connection it is interesting to note that one of the patients with cirrhosis receiving daily doses

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12. Furnished by Parke, Davis & Co., Abbott Laboratories, Hoffmann-La Roche, Inc., and E. R. Squibb & Sons, respectively. The first three products were in solution and the last product in crystalline form.

13. Dr. S. A. Anderson of New Haven, Conn., and Sharp & Dohme supplied us with this material.

14. Flynn and Warner, cited by Brinkhous.³

15. Almquist, H. J.: Chemical and Physical Studies on the Antihemorrhagic Vitamin, *J. Biol. Chem.* **117**: 517-523 (Feb.) 1937.

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17. Smith, H. P., and Owen, C. A.: The Absorption of Water-Soluble Vitamin K Without the Aid of Bile Salts, *J. Biol. Chem.* **134**: 783-784 (July) 1940.

17. Supplied by Riedel-De Haen, Inc.

Results of Medication with Drugs Having Vitamin-K Activity

Patient	Age	Diagnosis	Drug	Amount, Mg.	Initial Prothrombin Level, Percentage of Normal	Time Elapsing Between Medication and Second Prothrombin Determination	Second Prothrombin Determination, Percentage of Normal	Final Prothrombin Level, Percentage of Normal	Total Amount of Drug Given, Mg.	Time Elapsing Between Initial Dose and Final Prothrombin Determination, Days
1. J. B.	42	Cancer of head of pancreas	4-amino-2-methylnaphthol hydrochloride	1.0	49.5	24 hours	65.2	84.9	4.0	4
2. C. B.	59	Cancer of head of pancreas	4-amino-2-methylnaphthol hydrochloride	1.0	13.9	24 hours	22.4	99.8	13.0	12
3. A. L.	52	Cancer of head of pancreas	4-amino-2-methylnaphthol hydrochloride	2.0	40.9	5 days	102.2	....	....	..
4. B. P.	67	Cancer of head of pancreas	4-amino-2-methylnaphthol hydrochloride	6.0	39.0	12 days	87.3	....	....	..
5. M. M.	69	Cancer of common bile duct	4-amino-2-methylnaphthol hydrochloride	6.0	18.4	5 days	78.1	....	....	..
6. S. V.	45	Stone of common duct	4-amino-2-methylnaphthol hydrochloride	1.0	79.6	2 days	85.0	96.0	2.0	7
7. W. F.	63	Bleeding peptic ulcer; chronic alcoholism	4-amino-2-methylnaphthol hydrochloride	1.0	89.5	3 days	103.2	....	....	..
8. T. L.	62	Cancer with metastases to liver	4-amino-2-methylnaphthol hydrochloride	3.0	64.9	3 days	86.0	....	....	..
9. E. S.	40	Multiple bruises; post-operative bleeding	4-amino-2-methylnaphthol hydrochloride	1.0	85.0	15 minutes	97.3	....	....	..
10. T. W.	53	Bleeding peptic ulcer	4-amino-2-methylnaphthol hydrochloride	16.0	78.0	10 days	94.0	....	....	..
11. M. I.	61	Stone of common duct	2-methyl-1,4-naphtha-hydroquinone-3-sodium sulfonate	4.0	28.0	2 days	66.7	70.7	10.0	5
12. G. J.	28	Stone of common duct	2-methyl-1,4-naphtha-hydroquinone-3-sodium sulfonate	2.0	95.4	24 hours	91.0	....	....	..
13. W. P.	41	Stone of common duct	2-methyl-1,4-naphtha-hydroquinone-3-sodium sulfonate	2.0	84.7	3 days	108.3	....	....	..
14. A. S.	74	Cancer of head of pancreas	2-methyl-1,4-naphtha-hydroquinone-3-sodium sulfonate	2.0	45.4	24 hours	80.4	93.4	10.0	8
15. Z. J.	45	Bacterial endocarditis	2-methyl-1,4-naphtha-hydroquinone-3-sodium sulfonate	2.0	71.0	20 hours	90.2	....	....	..
16. F. L.	61	Cancer of rectum	2-methyl-1,4-naphtha-hydroquinone-3-sodium sulfonate	2.0	75.6	24 hours	89.1	....	....	..
2. C. B.	59	Cancer of head of pancreas	2-methyl-1,4-dihydroxy naphthalene diphosphoric acid ester tetra sodium salt	100.0	72.2	9 days	89.6	....	....	..
17. O. H.	63	Obstructive jaundice (stone of common duct ?)	2-methyl-1,4-dihydroxy naphthalene diphosphoric acid ester tetra sodium salt	10.0	88.2	24 hours	103.2	....	....	..
18. H. K.	69	Cancer of head of pancreas	2-methyl-1,4-dihydroxy naphthalene diphosphoric acid ester tetra sodium salt	20.0	66.5	7 days	89.7	....	....	..
19. C. P.	63	Cancer of head of pancreas	2-methyl-1,4-dihydroxy naphthalene diphosphoric acid ester tetra sodium salt	10.0	82.6	19½ hours	103.3	....	....	..
20. L. T.	61	Cancer of head of pancreas	2-methyl-1,4-dihydroxy naphthalene diphosphoric acid ester tetra sodium salt	10.0	83.4	2 days	91.1	....	....	..
21. J. S.	82	Thrombopenia	2-methyl-1,4-dihydroxy naphthalene diphosphoric acid ester tetra sodium salt	10.0	81.2	24 hours	87.5	....	....	..
22. W. E.	47	Alcoholic cirrhosis	Phthiocol	400.0	77.5	4 days	80.0	....	....	..
23. E. W.	36	Ulcerative colitis	Phthiocol	150.0	88.8	11 days	109.5	....	....	..
24. J. N.	54	Alcoholic cirrhosis	Phthiocol	200.0	58.0	4 days	67.8	....	....	11
25. H. B.	49	Stone of common duct	Menadiolone	4.0	5.9	24 hours	45.0	105.1	22.0	2
26. H. B.	59	Cancer of head of pancreas	Menadiolone	2.0	83.5	2 hours	92.2	106.0	2.0	..
27. E. F.	77	Stone of common duct	Menadiolone	1.0	69.0	24 hours	81.2	....	....	..
28. E. J.	69	Stone of common duct	Menadiolone	1.0	80.7	4 hours	105.0	....	....	..
29. R. D.	51	Cholelithiasis	Menadiolone	2.0	87.4	3 days	96.0	....	....	6
30. A. L.	57	Cancer of common bile duct	Menadiolone	0.5	53.8	4 days	63.5	81.7	2.5	..
31. A. N.	61	Stone of common duct	Menadiolone	1.0	83.4	20 hours	93.5	....	....	..
32. C. S.	65	Cancer of head of pancreas	Menadiolone	0.1	85.6	20 hours	101.0	....	....	..
33. F. Y.	57	Cancer of head of pancreas	Menadiolone	3.0	67.2	8 days	97.0	....	....	..

Results of Medication with Drugs Having Vitamin K Activity—Continued

Patient	Age	Diagnosis	Drug	Amount, Mg.	Initial Prothrombin Level, Percentage of Normal	Time Elapsing Between Medication and Second Prothrombin Determination	Second Prothrombin Determination, Percentage of Normal	Final Prothrombin Level, Percentage of Normal	Total Amount of Drug Given, Mg.	Time Elapsing Between Initial Dose and Final Prothrombin Determination, Days
34. W. Z.	23	Hemophilia, catarrhal jaundice	Menadione	12.0	39.7	3 days	73.8	....	....	..
35. W. J.	38	Ileostomy	Menadione	1.0	92.0	2 hours	100.6	....	....	..
36. C. N.	27	Hemorrhage following tonsillectomy	Menadione	4.0	79.0	20 hours	87.0	93.1	8.0	44 hr.
37. L. R.	26	Menorrhagia and metrorrhagia	Menadione	0.1	76.0	44 hours	99.6	....	....	..
38. N. C.	61	Cancer with metastases to liver	Menadione	2.0	88.8	2 hours	100.0	....	....	..
39. J. E.	65	Bleeding from bowel (undetermined origin)	Menadione	0.1	90.6	20 hours	101.2	....	....	..
40. R. H.	49	Alcoholic cirrhosis	Menadione	7.0	57.0	4 days	88.6	....	....	..
41. F. K.	57	Alcoholic cirrhosis	Menadione	8.0	79.5	4 days	83.4	....	....	..
42. A. L.	53	Cirrhosis of liver (undetermined origin)	Menadione	228.0	87.5	128 days	81.5	....	....	..
43. A. M.	56	Alcoholic cirrhosis	Menadione	5.0	69.0	4 days	85.5	....	....	..
44. M. L.	30	Baati's disease (?) Acute hepatitis (alcoholic)	Menadione	3.0	77.6	2 days	90.1	....	....	..
45. J. B.	34	Threatened abortion	Menadione	1.0	80.0	12 hours	90.3	....	....	..
46. U. W.	52	Myelogenous leukemia	Menadione	2.0	73.2	1 hour	82.5	....	....	..
47. M. H.	74	Myelogenous leukemia	Menadione	2.0	44.8	1 hour	46.3	....	....	..
48. J. D.	44	Bronchiectasis with hemoptysis	Menadione	5.0	82.0	2 days	99.8	....	....	..
49. P. D.	50	Noctoxic goiter	Menadione	2.0	71.0	24 hours	94.2	....	....	..
50. J. K.	52	Cancer of common bile duct	Menadione	0.25						
51. L. K.	55	Cirrhosis of liver (undetermined origin)	Menadione	166.0	56.2	15 hours	77.0	87.6	....	..
					60.5	102 days	63.7	....	....	..
52. T. N.	54	Cirrhosis of liver (undetermined origin)	Menadione	161.0	49.3	93 days	66.2	....	....	..

of vitamin K and bile salts orally and vitamin K intravenously on two occasions in which the bile salts were discontinued showed a drop in his prothrombin level with a resumption of the tendency to bleed. The bleeding stopped and the prothrombin level returned to its former status when the bile salts were resumed. This would suggest that the patient's vitamin requirement was high and the bile salts were necessary to the proper absorption of the material taken by mouth, even though bile was present in the bowel. Or it might suggest that in certain cases of hepatic insufficiency the bile salts serve an additional function to that of aiding in the absorption of the vitamin.

In this and in 1 other case of cirrhosis there was a limited response to the oral administration of vitamin K. Subsequent intravenous therapy was followed by a prompt further elevation of prothrombin and a dramatic improvement in the clinical condition of the patient. In both cases there was advanced peripheral edema and some ascites, and it is possible that an accompanying edema of the bowel interfered with the proper absorption of the vitamin.

REACTIONS

Koller³ gave 4 healthy persons 180 to 200 mg. of menadione by mouth. No abnormality was noted except nausea. In rabbits a dose of 30 mg. per kilogram of body weight produced no symptoms. In dogs, however, in doses of 15 to 30 mg. per kilogram given intramuscularly, menadione caused vomiting, albuminuria and porphyrinuria. Warner and Flynn¹⁸ found that the potassium salt of the disulfuric acid ester of 2-methyl-1, 4-naphthohydroquinone was not toxic to rats in doses of one hundred times the physiologic requirements. In the present study no reactions were observed, either immediate or delayed. The material is irritating to tissues if it gets outside the vein. A total of 1,315 doses of vitamin K active substances have been administered intravenously during the past twenty months. One patient received 880 mg. of phthiocol over a period of

fifty-six days and during the next five months 336 mg. of menadione. As much as 20 mg. of the latter was given in one day. Three patients received 2 mg. of menadione intravenously daily (except Sundays) over a period of three months and three days, three months and twelve days and four months and sixteen days respectively. No toxic effects were observed. The urine of the 4 receiving prolonged administration was porphyrin free.

From this study it would appear that menadione is effective in doses of 0.5 mg. or less intravenously and that this dose is well below the toxic dose of the drug.

INTRAVASCULAR CLOTTING

The question has been raised of intravascular clotting from an overdose of vitamin K. From this study there appears to be a limit to the level to which the prothrombin can be elevated, even with large doses of the vitamin. In none of the cases was there any evidence of thrombus formation. It is interesting to note in this connection that high levels of prothrombin apparently may exist without the occurrence of intravascular clotting. Prothrombin levels fluctuate widely during pregnancy. In 1 case observed in the obstetric clinic of the Presbyterian Hospital the level ran as high as 175 per cent without any abnormal condition being apparent.

SUMMARY

1. A number of synthetic compounds were administered intravenously to patients with lowered prothrombin levels, followed by an elevation of the prothrombin. No toxic effects were observed.

2. Menadione is highly active and is sufficiently soluble to be of practical clinical use.

3. In some cases in which response to the oral administration of vitamin K is poor the intravenous use may be of benefit.

4. Bile or related substances ordinarily are not required for the utilization of the vitamin when it is administered intravenously. There is some indication that certain patients may receive maximum benefit only when bile substances are used.

1753 West Congress Street.

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Clinical Notes, Suggestions and New Instruments

SPECIFIC CUTANEOUS REACTIONS WITH HISTOPLASMOSIS

PRELIMINARY REPORT OF ANOTHER CASE

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Meleney's¹ recent review of histoplasmosis (Darling) listed 32 cases. Since his review 2 more cases of the disease have been reported by Brown, Havens and Magath² and by Rhodes, Conant and Glesne.³ Another case, in which a patient recently admitted to St. Luke's Hospital for the diagnosis and treatment of a chronic lesion of the larynx was found to have the Histoplasma capsulatum infection, is reported here. The tissues in the lesion of the larynx had the specific structure seen in histoplasmosis. The mold was cultured from specimens taken for biopsy. Intradermal injections of filtrates of broth cultures of the fungus in the patient and in animals experimentally infected caused immediate and delayed specific cutaneous reactions.

REPORT OF CASE

A white man aged 63 had irritation of the throat and hoarseness for eighteen months, pain in the left side of his throat for seven months and a loss of 40 pounds (18.1 Kg.) in six months. He had dull epigastric distress aggravated by food but relieved by emesis, sodium bicarbonate and warm water. The symptoms increased in severity. He had dysphagia, weakness, occasional nocturnal sweats and a chronic cough. He occasionally expectorated thin sputum streaked with blood. He had had diphtheria in 1915, gonorrhea and syphilis in 1925 for which treatment had been given, pleurisy in 1932 and chronic otitis media on the left side. He had used laxatives, hydrochloric acid and patent remedies. In his youth he had been a carpenter and later a bartender.

The patient was weak, obviously had lost considerable weight and had a hoarse speech. The temperature was 98.6 F., the respiratory rate 18, the pulse rate 80 and the blood pressure 115 systolic and 75 diastolic. The eyes reacted to light and in accommodation; the mucosa of the nose was normal. The right external ear was normal; the left contained dried exudates. The teeth were in fair condition, but the gingival margins were ulcerated and bled freely. The largest of the ulcers at the base of the left first molar caused considerable discomfort and had been treated repeatedly without success.

On examination with a mirror the left true cord of the larynx was seen to have a small polypoid tumor in the mid-portion of the phonating edge. The aryepiglottic folds and arytenoid cartilages were thickened, and their laryngeal surfaces had a soft, slightly ulcerated mass extending across the entire posterior commissure. This lesion was red and was covered with a gray purulent secretion. The motility of the cords was impaired by the mass. There was hyperresonance of both lungs with numerous fine rales. The abdomen was soft and protuberant, and the epigastrium was definitely tender. The liver extended 3 cm. below the inferior right costal margin. The only other noteworthy physical sign was a longitudinal ridging of the finger nails and toe nails.

The Kahn reaction of the blood was negative, the urine contained nothing unusual and repeated examination of the stool and the sputum gave negative results. Biopsies done on the sternum gave negative results and differential blood stains were normal. The red blood cell count ranged from 5,120,000 on admission to 4,680,000 on Feb. 15, 1941, the hemoglobin

content was 15.4 to 12.8 Gm. per hundred cubic centimeters and the leukocyte count ranged from 7,950 to 5,620 per cubic millimeter.

Roentgen examination of the larynx suggested an irregularity of the body of the thyroid cartilage and a slight increase in density about the arytenoids. The esophagus, heart and aorta showed no changes. Both lungs had increased root shadows, and there were many small calcified regions in the left hilus. The peribronchial tissues were thickened in both pulmonary fields. A complete gastrointestinal study demonstrated only decreased motility of the ileum. The liver and spleen were enlarged.

On direct examination of the larynx the day after admission the mucosa of the larynx had the usual color. A small round polyp was attached near the center of the phonating surface of the left vocal cord. This was removed and the edge of the cord straightened. A verrucous ulcerated mass extended from side to side across the posterior commissure involving the upper surface of the arytenoids and extending below the level of the two cords. It spread laterally into the ventricles and superiorly on the lateral margins to involve the posterior surface of the false cords. Tissues were removed for histologic study, and secretions were taken for bacteriologic examination.

The tissues removed were examined by Dr. Edwin F. Hirsch. A surface squamous epithelium present on some sections was regular but at other levels it was thin, and the underlying cellular stroma extended to the surface. The unusual feature of the tissues was the cellular content of the stroma. In this fibrillar tissue were lymphocytes, plasma cells and many large mononuclear phagocytes. The last-mentioned cells had an acidophilic granular cytoplasm and round vesicular nuclei with granules of chromatin. They varied in size; some were huge, and in the cytoplasm of the cells were clusters of small oval bodies with a small central mass of granular cytoplasm and a hyaline membrane. In some of the large cells the number of inclusions was so great that the cytoplasm appeared vacuolated. The growth of fibroblastic stroma in certain regions was in excess, but in this also were isolated large cells with granular cytoplasm and inclusion bodies. The inclusions were interpreted as some fungus, and the lesion was diagnosed as reticuloendothelial cytomyces (histoplasmosis of Darling). The suggestion was made also that other tissues be removed for culture and for confirmation of the diagnosis. Accordingly by a second direct examination of the larynx Nov. 20, 1940 the previous observations were confirmed. More tissue was removed for histologic and cultural studies.

The patient had lost 10 pounds (4.5 Kg.) more since admission, and his symptoms continued. Small ulcers developed in the left premaxillary region of the mandible and on the right side of the tongue posteriorly from which no unusual organisms were cultured. His spleen became palpable at the costal margin, but the liver did not become larger. The temperature in the afternoon or in the evening rose to 99 or 99.6 F.

Vitamins and fluids were administered intravenously to maintain adequate nutrition. The specific therapeutic agents used were nearsphenamine, sulfanilamide, potassium iodide, yellow bone marrow, gargles of potassium permanganate and antimony and potassium tartrate intravenously. These did not change the patient's condition. He died approximately five months after his condition was first diagnosed.

CULTURAL STUDIES

Cultures were taken of tissues removed from the larynx on November 20 and two sponges with exudates from the tissues on human blood agar, 10 per cent rabbit blood agar and Endo's agar plates, on semianaerobic and anaerobic blood slants and in broth. Two sets of plates were inoculated; one was kept at 37 C. and the other at room temperature. Growth appeared on the plates kept at 37 C. in seventy-two hours and on those kept at room temperature in five days. Fuzzy white colonies appeared, 0.5 to 1.5 cm. in diameter. They adhered closely to the medium and did not emulsify in saline solution. The colonies on dextrose agar were white; those on blood agar were reddish gray. In preparations stained by the Gram method the growth consisted of faint gram-negative filaments. In

From the Henry Baird Favill Laboratory of St. Luke's Hospital. Dr. Van Pernis is the John Jay Borland fellow in clinical research.

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days, round chlamydospores appeared as branches of the mycelium and at the ends of hyphae. These were round or slightly oval bodies 3.9 to 10 microns in diameter. They had a thick wall and a vacuolated center. Scarlet red demonstrated the presence of globules of fat. After seven days there were ascus-like bodies as well as chlamydospores. The ascus-like bodies resembled the latter except that their outer margins had small nodes and became knotty or uneven. Globules of fat were present.

Growth in the semianaerobic and anaerobic slants and in broth appeared three to four days later than that on the aerobic plates. Subcultures were made in beef heart, brain broth and dextrose broth. Fluffy, white, ball-like colonies connected together with fine, threadlike mycelium, grew quickly in the dextrose broth. The colonies of subcultures on blood cell agar plates appeared in forty-eight hours and those on plasma agar in seventy-two hours. After four days the growths on the two were approximately equal. As the colonies grew older the chlamydospores and ascus-like bodies gradually disappeared, leaving only a mycelium.

Dextrose, lactose, sucrose, maltose, mannite, salicin, trehalose, sorbitol, arabinose, levulose, gallactose, dextrin, xylose, raffinose, inulin, litmus milk, peptone water and acetyl-methyl carbinol were not fermented. Indole was produced in the peptone medium.

A five day old culture on dextrose agar and a seven day old culture on agar were triturated in a mortar, suspended in saline solution and injected intraperitoneally into mice, rats, guinea pigs and rabbits. After two weeks the mice had no gross lesions. Stained preparations of blood and dextrose agar cultures, however, demonstrated mycelial threads and a few oval yeast forms, 2 to 4 microns in diameter, with granules and vacuoles. In subcultures, both the yeast and the mold form produced only mycelial threads. Cultures taken from the tissues of rats were sterile. Cultures taken on blood and dextrose agar of hepatic tissues from guinea pigs killed six weeks after inoculation contained the mycelial form after seven days. Tissues of the spleen and lung removed from mice had many large monocytes containing refractile coccoid bodies with a thick capsule. Some contained two or three of these refractile bodies; others had ten to twenty. Other tissues showed no changes. A few yeastlike bodies were found in the spleen and mesenteric lymph nodes of the guinea pigs. Tissues from the rats showed no changes.

CUTANEOUS TESTS

Two 250 cc. quantities of dextrose broth culture medium inoculated with *H. capsulatum*, one on Nov. 30, 1940 and the other on December 14, were centrifuged on Jan. 7, 1941 to remove the heavy mycelial growth. The supernatant liquid was passed through a Berkefeld W filter and then tested for sterility. The undiluted filtrate and dilutions of 1:1,000, 1:100 and 1:10 in 0.1 cc. amounts were injected intradermally into the patient with histoplasmosis and into mice inoculated with the mycelium. Cutaneous reactions were produced in all dilutions in the patient and in the inoculated mice. Control injections of these preparations in other patients and in uninfected mice gave negative results.

There were two varieties of cutaneous reactions in the patient and in the mice, an immediate and a delayed reaction. The immediate reaction appeared only with the undiluted filtrate, fifteen to thirty minutes after the injection. It consisted of a wheal 1 to 1.5 cm. in diameter with an erythematous margin 1 cm. wide. The delayed reaction, clearly visible after eighteen to twenty-four hours, was a well defined erythema and swelling of the skin. In the patient at the height of the reaction this region was 3.5 to 6.5 cm. in diameter. The reaction disappeared gradually in about six days. Intradermal injections of 0.1 cc. of dextrose broth in the patient and in human controls caused no reactions.

Filtrates of dextrose broth treated with three volumes of acetone U. S. P. yielded a flocculent precipitate. The precipitate was redissolved in a small amount of 0.9 per cent saline solution. Intradermal injections of 0.1 cc. of the solution in

the patient and in infected mice also produced a typical wheal and erythema in thirty to sixty minutes. Tests on controls gave negative results.

No precipitin reactions were obtained with the patient's serum, in dilutions of 1:2 to 1:128, and the undiluted filtrate or the acetone precipitate redissolved in saline solution. Complement fixation tests using the antigens mentioned also gave negative results.

SUMMARY

H. capsulatum was cultured from material taken from laryngeal lesions, doubtless part of a more extensive infection, in a man aged 63. Broth culture filtrates of the fungus isolated from these lesions produced specific immediate and delayed cutaneous reactions in the patient and in mice experimentally infected. The specific substance responsible for the cutaneous reactions with these broth filtrates was precipitated with acetone. The flocculent precipitate was readily soluble in saline solutions.

SENSITIVITY OF PNEUMOCOCCI TO SULFAPYRIDINE: A RAPID QUALITATIVE TEST FOR RESISTANCE; CLINICAL EVALUATION OF THE PROBLEM

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Differences in the sensitivity of pneumococci to sulfapyridine have been suggested since the earliest days of its use.¹ MacLean, Rogers and Fleming² observed decided differences both *in vivo* and *in vitro*, and developed, as did Macleod and Daddi,³ a strain resistant to sulfapyridine by passage of a sensitive strain through treated mice. These observations have been confirmed and extended⁴ and may be summarized as follows: Pneumococci differ profoundly in their sensitivity to the sulfonamides; resistant strains occur in nature; sensitive strains may become resistant when they are exposed to the drug in either the test tube, mouse or human being; resistant strains are probably permanently resistant.

The clinical implications of these results are most grave. The rational therapy of pneumococcal pneumonia demands knowledge of the sensitivity or resistance of the organism: chemotherapy in the absence of this knowledge is analogous to serotherapy in the absence of knowledge of type. The golden opportunity to cure the patient may pass before the patient's clinical course can suggest that he is infected with a resistant strain. Present laboratory tests for fastness are research pro-

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cedures requiring days rather than hours. There is hence an urgent clinical need for a rapid test for resistance.

Virulent pneumococci, injected intraperitoneally into mice, cause an overwhelming pneumococcal peritonitis within a few hours. This is definitely altered by sulfonamide therapy,⁵ the peritoneal exudate showing few and atypical organisms. We

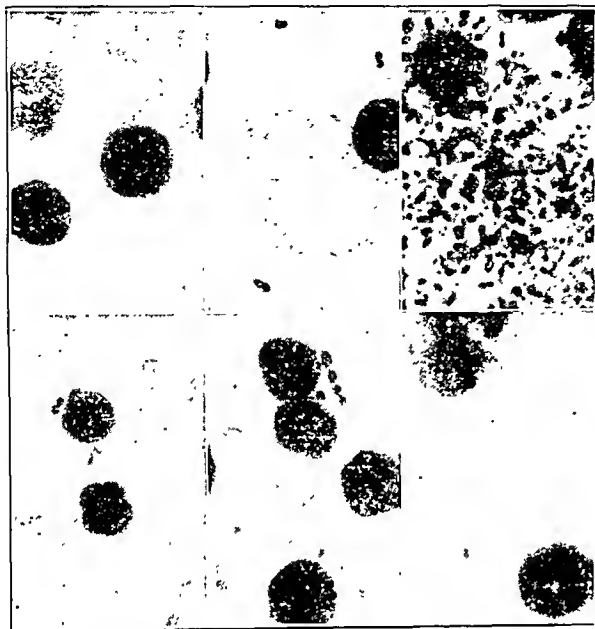


Fig. 1.—Section showing numbers of pneumococci in peritoneal exudates taken at two, eight and twenty hours from one control (upper) and one treated mouse (lower).

have therefore injected the sputum of patients into treated and untreated mice, comparing their exudates at various intervals. Among the first 33 patients studied have been those representing each therapeutic category. This, and the encouraging results of the test, make it advisable to indicate our observations without awaiting the results of more elaborate studies in progress.

MATERIAL AND METHOD

The test has been run on fresh sputum or empyema pus obtained from 33 patients, representing the following types of pneumococcus: I to X, XIV to XVI, XVIII to XX, XXXI, XXXII and "no type." The sputums were those sent to the laboratory for typing, usually on admission of the patient.

Each of four mice was inoculated intraperitoneally with 0.2 cc. of 10 per cent sulfapyridine suspended in 20 per cent acacia. No further treatment was given. Sputum (or pus) was made grossly homogeneous and liquid by mixing with a minimum necessary amount of sterile saline solution. Within the first two hours after treatment the 4 treated and, in addition, 3 untreated mice were alternately inoculated with the sputum mixture, as large a volume as possible (up to 1 cc.) being used for each mouse. At various intervals thereafter peritoneal exudate was removed from each mouse and examined rapidly to determine the number and the morphology of the pneumococci. Efforts to make accurate counts were avoided. The test was read when growth of pneumococci in the untreated mice had become unquestionable (as indicated by hundreds per oil immersion field), and at no earlier time. If, at this time, the treated mice showed no increase in the number of pneumococci, or if there had been scanty growth with a preponderance of atypical forms, the strain was called sensitive; if smears of treated and control mice were virtually indis-

tinguishable, the strain was called resistant (fast or refractory). The records were completed by subsequent smears and by observation of death, though these were not strictly a part of the test. To estimate the reliability of the test, it has been repeated a total of twenty times on three strains, 24, 60 and 100 mice respectively being used.

The results of the test were compared with the clinical records. Observations in the laboratory and in the ward were independently conducted, neither being influenced by the other.

RESULTS

Figure 1 illustrates the results of the test in the case of a typically sensitive strain. Sections of smears of exudates from 1 of the 3 control and 1 of the 4 treated mice are shown at two, eight and twenty hours after inoculation. In this case, the effectiveness of the drug is indicated by intense bacteriostasis. In figure 2 are illustrated organisms from a treated mouse inoculated with a sensitive strain, indicating the atypical structure which is sometimes observed, e. g. chaining, megacapsulation, heteromorphism and fragmentation. In the resistant strain (not illustrated), the numbers of pneumococci in treated and in control smears increase equally rapidly. In cases in which the test was repeated, complete confirmation of results was always obtained.

The total working time per test has averaged about thirty to forty minutes. The average time from inoculation to the appearance of overwhelming numbers of pneumococci in the exudate (e. g. to completion of the test) has been eighteen hours. All but three of the tests were completed between the second and the twenty-fourth hour, the other three requiring up to sixty-five hours (probably reflecting the fact that in these tests the mice received only 0.1 cc. of diluted sputum). On the average, it took more than three times as long (three and two-tenths) for the organisms to multiply profusely in treated mice as it did in the controls.

Among the 33 patients from whom specimens were obtained, the pneumococcus of one strain⁶ was resistant and of the others sensitive. Two patients with sensitive strains and the one with a resistant strain failed to respond to chemotherapy, the remainder ran a satisfactory clinical course. The cases of the 3 who failed to respond are reported here:

CASE 1.—A white woman aged 28 had clinical and roentgen evidence of pneumonia of the left lower lobe. She had been ill (untreated) with symptoms of pneumonia for three days; on admission her temperature was 101.4 F., her pulse rate 120 and leukocytes 24,000. Ten Gm. of sulfathiazole was given in the next thirty-two hours. At the end of this time she had, if anything, grown worse and was weak, toxic and apprehensive. Specific serum, 300,000 units of type I, was given in the next six hours, followed immediately by profound subjective and objective improvement. She was discharged well on the sixteenth day of illness. Pneumococcus type I in the admission sputum was resistant to sulfapyridine in mice.

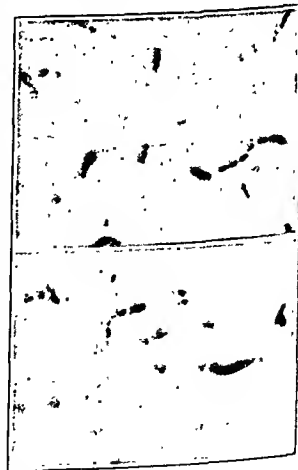


Fig. 2.—Atypical pneumococci in the peritoneal exudate of a treated mouse.

CASE 2.—A man aged 29, a Mexican, with type II pneumococcus pneumonia of the left lower lobe of four days' duration was given sulfathiazole without improvement from the fourth to the seventh day, serum (390,000 units) on the seventh day, followed by some slight improvement and the development of a positive Francis reaction.

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6. A second resistant strain has been recovered: pneumococcus type XV from a patient with postoperative pneumonia who has had a long, atypical and refractory course and is still under treatment, a pleural effusion having now developed.

and sulfapyridine from the eighth to the seventeenth day with very gradual improvement. Pus was now aspirated from the chest. Though they had not been able to find conclusive evidence to that effect, the staff felt that a small and hidden pocket of empyema had probably been present since early in the disease. Pneumococcus type II both in the admission sputum and in the empyema was sensitive to sulfapyridine in mice.

CASE 3.—A white man aged 64 with severe diabetes was on 60 units of insulin daily. On admission he suffered from diabetes (uncontrolled for two months), type IV pneumococcus pneumonia of three lobes (four days' duration), severe leukopenia, auricular fibrillation and congestive failure. Specific serum, sulfathiazole, rapid digitalization and suitable diabetic therapy kept him alive for five days. At autopsy, cultures taken from the affected lungs were not successful. Pneumococci in the admission sputum were sensitive to sulfapyridine in mice.

Prior to the development of this test, we saw a patient who had been treated with sulfapyridine in a desultory and vacillating manner over a period of two months. At first each exposure to the drug resulted in clinical improvement; later there was less and less response to each exposure. He was then admitted to this hospital where enormous amounts of sulfapyridine were given, producing a blood concentration of 15 mg. per hundred cubic centimeters. The blood cultures, however, remained positive, and at autopsy he was swarming with pneumococci. A pure culture was obtained and injected in various dilutions into treated and untreated mice. No difference was observed between the two groups in time or rate of mortality, and the strain was considered drug fast. The delay, difficulty and expense of this test prompted us to develop the present method.

COMMENT

The rapid qualitative test reported has been found to be simple to perform, to require an average of eighteen hours for completion (usually four to twenty-four), and to have a sharp end point. We have not yet examined other sulfonamides nor sought to make the test more quantitative, though such studies are in progress. The possibility of using an analogous method with culture medium substituted for the mouse is under examination, but we have little hope of this proving suitable.

With regard to their response to chemotherapy, patients with pneumonia fall into several categories. Patients of group A, the present majority, are infected with a sensitive strain and respond beautifully to the drug. Those of group B, also infected with a sensitive strain, respond poorly or not at all, their lack of improvement being referable to the presence of a severe concomitant disease (case 3) or to the presence of a complication of pneumonia (case 2 probably represents this group). Those of group C are initially infected with a sensitive strain which develops fastness during chemotherapy, so that a preliminary improvement is succeeded by clinical resistance (Ross⁷ and probably our last case). Patients of group D are infected with a resistant strain from the first; their progress is the same as that of untreated pneumonia (except for the added hazard of injury by the drug), and effective therapy, such as serum or some chemotherapy to which the pneumococcus is sensitive, must be given as soon as possible (case 1).

It is no less important for the clinician to bear these possibilities in mind than for him to be able to secure, at the beginning of treatment, the bacteriologic information necessary to evaluate properly the progress of the case, or to alter entirely his plan of treatment if the organism is resistant.

SUMMARY

A rapid, qualitative test, based on the inoculation of sputum into treated and untreated mice, has been developed to indicate the sensitivity or resistance of pneumococci to sulfapyridine.

The clinical response of patients to chemotherapy compared with the results of the laboratory test has given encouraging results.

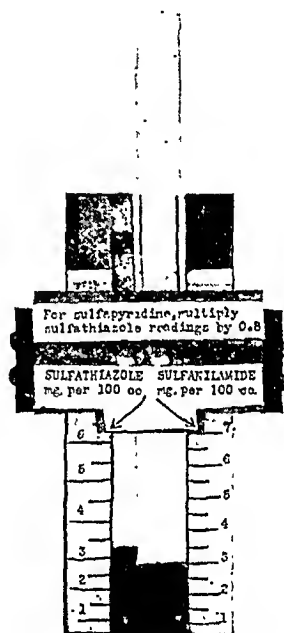
A RAPID BEDSIDE TEST FOR THE CONCENTRATION OF SULFANILAMIDE, SULFAPYRIDINE AND SULFATHIAZOLE

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In the treatment of infectious diseases with drugs of the sulfonamide group it is desirable to maintain an optimum concentration of these drugs in the blood, and therefore periodic tests are essential for best results. The method herein described is simple and accurate and can be performed in a few minutes at the bedside or in the office. It is a modification of the Marshall method, but it has the following advantages: All reagents are stable, in tablet form. No pipets are required except one for collecting blood. Only 0.1 cc. of blood for sulfanilamide and 0.2 cc. of blood for sulfapyridine and sulfathiazole are required. The blood can either be oxalated or be obtained from the finger tip or the ear lobe.

A special colorimeter has been developed for this test which is small, compact and accurate and can be carried in a bag or in a pocket. It consists of a lucite wedge mounted on a frame. Attached to the frame is a sliding window, with an attachment to hold the test tube containing the substance to be examined. A scale attached to the frame indicates the concentration of sulfanilamide, sulfapyridine and sulfathiazole. The advantage of a lucite wedge standard is its absolute stability of color; furthermore it is unbreakable and can be made in any shade to match any color at little expense.

As for the test itself, the proteins are precipitated and the proper acidity obtained by means of a tablet containing sulfosalicylic and tartaric acid. The sulfonamides are then transformed into a diazo compound with a tablet containing sodium nitrite and sodium chloride. Unlike the solution of sodium nitrite used in the Marshall method, which is not stable, this reagent has not deteriorated for a period of more than two years. The excess of sodium nitrite is removed with a tablet containing sulfamic acid and tartaric acid. This combination is superior to a solution of ammonium sulfamate as it keeps indefinitely in dry form and also works more rapidly. The diazo compound is finally transformed into a colored compound with a tablet containing N-(1-naphthyl)-ethylene-diamine dihydrochloride which is rendered more stable in dry form by the addition of tartaric acid. The tablets are made in the proportions given in the accompanying table.



Lucite wedge colorimeter.

Composition of Four Tablets Used in Test

Tablet No. 1	Tablet No. 2	Tablet No. 3
Mg.	Mg.	Mg.
Sulfosalicylic acid... 50	Sodium nitrite.... 0.3	Sulfamic acid... 1.5
Tartaric acid..... 50	Sodium chloride... 30	Tartaric acid.... 29
Talcum..... 100		
Tablet No. 4		
N-(1-naphthyl)-ethylene-diamine dihydrochloride. 0.3 mg.		
Tartaric acid..... 1.5 mg.		
Sodium chloride..... 29 mg.		

APPARATUS REQUIRED

A pipet for obtaining blood, graduated at 0.1 and 0.2 cc.; two small test tubes, 13 by 100 mm., graduated at 2 cc. and 0.95 cc.; a small funnel, 1 inch in diameter, and the colorimeter described comprise the requisite apparatus for the test.

From the Department of Medicine of the College of Medical Evangelists.

7. Ross, R. W.: Acquired Tolerance of Pneumococcus to M. & B. 693, *Lancet* 1:1207-1208 (May-27) 1939.

PROCEDURE

Fill test tube with water to the upper mark. Add 0.1 cc. of blood to test for sulfanilamide and 0.2 cc. of blood for sulfapyridine and sulfathiazole. Shake test tube and let stand for half a minute. Add one tablet no. 1. Shake tube and let stand for half a minute. Filter into another test tube until filtrate reaches lower mark. Add one tablet no. 2. Shake test tube and let stand for half a minute. Add one tablet no. 3. Shake test tube and let stand for half a minute. Add one tablet no. 4. Shake test tube. Insert test tube into clip of colorimeter, slide window up or down until the color of the unknown matches the lucite wedge standard and read concentration expressed in milligrams per hundred cubic centimeters of blood on the scale.

CONCLUSION

In a new, rapid, bedside method for the determination of sulfanilamide, sulfapyridine and sulfathiazole, tablets which are stable and a new microcolorimeter with a lucite wedge standard are employed.

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COMA FOLLOWING MEDICATION WITH
TETRACHLORETHYLENE

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On the score of safety and high efficacy especially against hookworms, tetrachlorethylene (C_2Cl_4), first introduced into human medicine via the veterinary field by Hall and Shillinger¹ in 1925, enjoys great repute as approaching the ideal in anthelmintics. Its sponsors expressed the opinion that tetrachlorethylene would be found to be safer than carbon tetrachloride, a view which has been amply substantiated by later clinical experience. This is also borne out by the pharmacologic studies of Lamson, Robbins and Ward,² who wrote as follows: "Tetrachlorethylene differs from carbon tetrachloride in being absorbed little, if at all, in the intestinal tract of dogs in the absence of fat. If fat is present, or if enormous doses are given to animals of different species, absorption may take place with symptoms or even death, but these symptoms are those of an overdose of hypnotics, not those of chemical change secondary to liver damage, as in the case of carbon tetrachloride."

In adult doses ranging from 0.5 to 8 cc. the drug has been used on a broad scale and in some countries appears to have become the preferred anthelmintic for mass treatment of hookworm infection.³ Although there is no way of obtaining any reliable figures on the matter, it is reasonable to believe that by now many hundreds of thousands of people have been treated with tetrachlorethylene.⁴

Because not a single death following the use of this drug has been reported in the literature thus far and because specific attention has not been called to untoward toxic symptoms, most textbooks on tropical medicine and parasitology and practically every physician experienced in the use of this drug with whom I have compared notes express the view that tetrachlorethylene is harmful only to the parasitic worms against which it is directed. Few are familiar with the case of Kendrick,⁵ who, writing on the treatment of some 1,500 prisoners in the Madras penitentiary, recorded that 1 person showed signs of serious intoxication. About one hour after treatment this man complained of giddiness and soon there-

after completely lost consciousness; his pulse was barely perceptible, the eyelids were twitching and the whole body was covered with a cold, clammy perspiration. He slowly revived after two intramuscular injections of $\frac{1}{32}$ grain (0.0018 Gm.) of strychnine and $\frac{1}{50}$ grain (0.0012 Gm.) of digitalin; after the return of full consciousness no further symptoms developed. The man's personal history gave no clue as to the possible cause of this unexpected intoxication.

Recently Hare and Dutta,⁶ working on a tea estate in India, reported favorably on the efficacy of 4 cc. doses of tetrachlorethylene as compared with 20 to 30 minims (1.2 to 1.8 cc.) of oil of chenopodium. With regard to toxicity, they stated that all their 84 patients experienced a sensation of drunkenness (which they rather enjoyed) lasting for an hour or so. A debilitated girl aged 18, suffered from severe vomiting, giddiness and heavy drowsiness. After cold had been applied to the head she recovered and was perfectly well by evening.

In a recent paper on the treatment of infection with the hookworm in India, Maplestone and Mukerji⁷ wrote: "With regard to tetrachlorethylene we had our own experience of many years' use of the drug on human beings as well as our pharmacologic work on cats which showed that the dose of 4 cc. is so far below the dangerous limit that it is not necessary to reduce the dose in adults, however low their weight may be. In addition to our own experience, a good deal of other evidence of the safety of C_2Cl_4 has now accumulated and so far the only case reported of its apparent toxic effects is that of Kendrick (1929) in which the serious symptoms rapidly passed off. As it is now over ten years ago since this isolated case was reported and no similar ones have since been recorded, it seems reasonable to look on it as unique and of no real importance as an argument against the safety of tetrachlorethylene." In making the foregoing statement, Maplestone and Mukerji doubtless overlooked the details of a case recorded in America by Wright, Bozicevich and Gordon,⁸ who in 1937 described the results of treating 50 boys for pinworms. One of their patients, a boy aged 11, who received a dose of only 1.1 cc. of tetrachlorethylene in 30 cc. of a saturated magnesium sulfate solution plus 60 cc. of water, showed symptoms of dizziness and depression one hour after treatment. The patient complained of eructations of the drug. One and a half hours after treatment he became cyanotic and during the next half hour lost consciousness four times. He was given 0.2 cc. of a 1:1,000 solution of epinephrine hydrochloride intramuscularly, after the administration of which his condition showed immediate improvement. This patient was subsequently found to have pulmonary tuberculosis.

During the course of the past twelve years I have accompanied several expeditions into various parts of the tropics of the New and the Old World where, because of helminthologic interest, anthelmintic treatment of several hundreds of natives of all ages and of several aboriginal races was carried out. Although other anthelmintics for intestinal worms, such as oil of chenopodium and carbon tetrachloride, were frequently used on these expeditions without incurring the slightest difficulty, the fear of an accident following carbon tetrachloride, with all the complications which a death might entail for an expedition far from civilization and hospital facilities, has led to a preference for tetrachlorethylene on account of its less sullied reputation. On four occasions I myself have received the drug in doses of 4 and 5 cc. Never has it produced more than a transient (and not unpleasant) sensation of levitation accompanied by a feeling of drowsiness that develops into a light sleep unless an effort is made to keep awake. Such apparently is the normal reaction to tetrachlorethylene. The soporific effects are evidence of absorption from the intestine, and the odor of the drug is detectable on the breath for several hours after medication.

It is my purpose in this paper to place on record 2 cases in which the effect of tetrachlorethylene was essentially the same

The observations on which this communication is based were made during the author's tenure of a John Simon Guggenheim Memorial Foundation Fellowship.

1. Hall, M. C., and Shillinger, J. E.: *Tetrachlorethylene: A New Anthelmintic*, *Am. J. Trop. Med.* 5: 229 (May) 1925.

2. Lamson, P. D.; Robbins, B. H., and Ward, C. B.: *The Pharmacology and Toxicology of Tetrachlorethylene*, *Am. J. Hyg.* 9: 430 (March) 1929.

3. Fernando, P. B.; D'Silva, M.; Stork, G. K. B., and Sinnatamby, G. R.: *Tetrachlorethylene in the Treatment of Hookworm Disease*, with Special Reference to Toxicity, *Indian J. M. Research* 26: 759 (Jan.) 1939.

4. Lambert, S. M.: *Hookworm Disease in the South Pacific: Ten Years of Tetrachlorides*, *J. A. M. A.* 100: 247 (Jan. 28) 1933. Faust, E. C.: *The Pharmacopeia and the Physician: The Use of Anthelmintics*, *ibid.* 108: 386 (Jan. 30) 1937.

5. Kendrick, J. F.: *The Treatment of Hookworm Disease with Tetrachlorethylene*, *Am. J. Trop. Med.* 8: 483 (Nov.) 1929.

6. Hare, K. P., and Dutta, S. C.: *Comparative Value of Oil of Chenopodium and Tetrachlorethylene as Anthelmintics for Use in Mass Treatment*, *Indian M. Gaz.* 74: 198 (April) 1939.

7. Maplestone, P. A., and Mukerji, A. K.: *Comparison of Tetrachlorethylene and Some Other Drugs in the Treatment of Hookworm Infection*, *Indian M. Gaz.* 75: 193 (April) 1940.

8. Wright, W. H.; Bozicevich, John, and Gordon, L. S.: *Studies on Oxyuriasis: V. Therapy with Single Dose of Tetrachlorethylene*, *J. A. M. A.* 109: 570 (Aug. 21) 1937.

as that described in the solitary cases of Kendrick and of Wright, Bozicevitch and Gordon mentioned previously.

CASE 1.—A young Javanese man at the time of treatment was a schizophrenic patient in the psychopathic wards of the central hospital in Batavia. The man was in an advanced catatonic state, sitting or lying around apathetically and entirely incapable of making any cooperative effort. To cause the expulsion of some echinostome flukes with which he was infested, the man was given 4.5 cc. of medicinal tetrachlorethylene in water, and this dose was followed about thirty minutes later by 30 Gm. of magnesium sulfate in dilute aqueous solution. For about an hour the patient lay quietly in bed, but when approached later he was found in a comatose condition, all peripheral reflexes having been abolished. An intravenous injection of metrazol was without immediate effect, but the patient commenced to emerge from the coma about two hours later and exhibited no further symptoms of intoxication.

In attempting to find a cause for this disconcerting and totally unexpected reaction, suspicion was first cast on the purity of the drug. However, chemical analysis revealed no impurities such as phosgene. It was then inferred that the dose of tetrachlorethylene may have been too high in relation to the man's size and weight, the small Javanese natives as a race generally showing greater sensitiveness and requiring smaller therapeutic doses of most drugs than do Caucasians.

Holding that the reaction just described was an instance of deep anesthesia that presented no serious reason for abandoning the use of tetrachlorethylene, further treatments were carried out among the Javanese with doses ranging from 2 to 3 cc. without any untoward effects. On a later expedition into the hinterland of Celebes, a series of natives ranging in age from about 6 to 60 years were treated with doses ranging from 1 cc. to 4 cc., again without any undesirable effects. Not one of the recipients was sufficiently affected by tetrachlorethylene to discourage other members of the patient's family from requesting the medicine.

It was consequently a matter of great surprise and not a little consternation when, after an uneventful taking of 5 cc. of tetrachlorethylene by me to eliminate an experimentally induced infestation with flukes, a second member of the expedition fell into deep coma after taking a much smaller dose of the same drug a few days later.

CASE 2.—A healthy, well developed man, with nothing in his past history or present condition which would lead one to anticipate that the drug would not be well borne, was given a smaller quantity of the drug solely to determine its vermifugal efficacy on a quantitative basis. Three cc. of well emulsified tetrachlorethylene was taken with a quantity of water into an empty stomach.

While awaiting the lapse of half an hour before taking a saline purgative, he proceeded to make himself comfortable in an armchair and commenced to read. Ten minutes later he was seen to be breathing deeply as though in profound sleep. Attempts to awaken him were futile. The muscles were completely relaxed, most of the reflexes had disappeared, the pupils were somewhat constricted and the pulse remained full, strong and regular. This condition persisted for nearly two hours, at which time an intravenous injection of metrazol was given. To this injection there was immediate response, but although the subject regained partial consciousness it was several hours before the stupor had worn off completely. He recalled nothing after taking the drug, expressed his satisfaction at having had a restful sleep and proceeded to assist in washing the stools that he passed for the worms contained therein.

COMMENT

Both of these cases presented what appeared to be the action of a general anesthetic akin to ethylene or chloroform. They obviously indicate the need for hospitalizing or otherwise keeping under close surveillance all patients who are treated with tetrachlorethylene even in doses smaller than are usual. While for want of a better drug they should not discourage the use of tetrachlorethylene, they illustrate the truth of a remark which the late Dr. Maurice Hall made to me, to the effect that one cannot assume that any anthelmintic is entirely safe for human use until there are reliable reports on at least a million treatments without any untoward effects.

Special Article

GLANDULAR PHYSIOLOGY AND THERAPY

THYROID DYSFUNCTIONS AND THEIR TREATMENT

WILLARD O. THOMPSON, M.D.

CHICAGO

This special article is published under the auspices of the Council on Pharmacy and Chemistry. It is one of a series which will be published in book form as the second edition of "Glandular Physiology and Therapy." The opinions expressed in this article are those of the author and do not necessarily represent the views of the Council.—ED.

CLASSIFICATION OF DISEASES¹

A. HYPOFUNCTION

1. Primary

(a) Cretinism

- (1) Sporadic
- (2) Endemic

(b) Myxedema

- (1) Spontaneous
- (2) Postoperative
- (3) Postinfectious
- (4) During administration of iodine

2. Secondary

- (a) Hypopituitarism
- (b) Addison's disease

B. HYPERFUNCTION

- 1. Exophthalmic goiter (Symmetric toxic goiter)
- 2. Toxic adenoma (Nodular toxic goiter)
- 3. Mixed type

C. USUALLY NO DISORDER OF FUNCTION

- 1. Simple goiter (Symmetric nontoxic goiter, colloid goiter)
- 2. Nontoxic adenoma (Nodular nontoxic goiter)
- 3. Anomalies of development
 - (a) Substernal goiter
 - (b) Pyramidal lobe
 - (c) Lingual goiter
 - (d) Thyroglossal cyst
 - (e) Lateral aberrant thyroid tissue
 - (f) Thyroid tissue in teratoma
- 4. Thyroiditis
 - (a) Suppurative: acute and chronic
 - (b) Nonsuppurative: acute and chronic
 - (c) Struma lymphomatosa
 - (d) Riedel's struma
 - (e) Chagas' disease (*Trypanosoma cruzi*)
- 5. New growths
 - (a) Primary
 - (1) Papillary adenocarcinoma—30 per cent
 - (2) Carcinoma in adenoma (malignant adenoma)—38 per cent
 - (3) Diffuse adenocarcinoma—31 per cent
 - (4) Squamous epithelioma—1 per cent
 - (5) Sarcoma—1 per cent
 - (b) Secondary
Metastases from other organs (rare)

ANATOMY AND PHYSIOLOGY

The chief object of this chapter is to discuss disorders of thyroid function. In order to do this intelligently, it is necessary to bear in mind a few pertinent

From the Department of Medicine, Rush Medical College of the University of Chicago and the Presbyterian Hospital, Chicago.
1. Thompson, W. O.: Endocrinology, in Allen, E. van N.: Specialties in Medical Practice, New York, Thomas Nelson & Sons, 1940, vol. 2, chap. 9.

facts about the anatomy and physiology of the gland. The thyroid normally lies in the front of the neck just above the manubrium. In the normal adult it weighs about 25 to 40 Gm. According to the needs of the body, it supplies an internal secretion of which thyroxin is an integral amino acid. It appears to be capable of producing its hormone at the time of birth, and under normal circumstances its maximum weight is reached about the time of puberty. The gland contains numerous follicles, lined by epithelium and surrounded by a rich network of capillaries and lymphatics. The active secretion is stored in the colloid, to be supplied to the body according to demand. The height of the cells surrounding the acini is related to the amount of colloid which the latter contain, the cells being cuboid when the acini are distended with colloid and columnar when the acini contain little or no colloid. The maximum storage capacity of the gland for iodine is about 5 mg. per gram of dried gland, or a total of about 25 to 40 mg. for the normal gland.² Whenever the iodine content drops below 1 mg. per gram of dried gland hyperplasia appears.

The thyroid elaborates thyroxin, or its equivalent,³ at the rate of about 0.3 mg. (0.2 mg. of iodine) per day,⁴ which means that in the allotted three score years and ten the normal gland elaborates about 8 Gm. In the tissues outside the thyroid in a normal man there is the equivalent of about 10 to 14 mg. of racemic thyroxin.⁵ These figures suggest that the iodine requirement of the normal thyroid is probably not more than 0.2 mg. per day and explain why so little iodine is required to prevent simple goiter and to produce a maximum reduction in basal metabolism in most patients with exophthalmic goiter (from 6 to 24 mg. daily). The maximum effect of thyroxin is dependent on the integrity of the molecule, and slight alterations greatly reduce, modify or abolish it.⁶ In the interpretation of the presence or absence of hypothyroidism it is important to bear in mind that it takes about seventy to ninety days for the basal metabolism to drop from normal to its lowest level (—40 to —50 per cent) after omission of thyroid, and a still longer period for the full blown picture of myxedema to develop.

HYPOFUNCTION

Hypothyroidism may be primary or secondary. The primary type is caused by loss of functioning thyroid tissue, produced by operative removal, infection or primary atrophy of unknown cause. The gland is usually largely replaced by scar tissue. Raising the basal metabolism to normal results in a complete cure. The secondary type is caused by lack of adequate stimulation of the thyroid. The gland is commonly smaller than normal but may be normal in size or even greatly enlarged. The gland tends to be in a resting state and to show flat or low cuboidal epithelium with storage of colloid. Raising the basal metabolism to normal with desiccated thyroid may produce some improvement, but there is left a residue of symptoms, e. g., amenorrhea, which is not corrected by correcting

the hypothyroidism. The primary type is seen in patients with cretinism or spontaneous myxedema and occasionally following subtotal thyroidectomy. The secondary type may occur in patients with hypofunction of the anterior lobe of the pituitary and in some patients with Addison's disease.

CRETINISM

Cretinism may be sporadic or endemic. Endemic cretinism is an end result of untreated endemic goiter lasting over a period of several generations. "Sporadic cretinism" is the term used to denote the cretinoid state that occasionally appears in the offspring of apparently healthy parents. In this country cretinism has been sporadic, but in Switzerland and some other mountainous areas it has been endemic. In this country endemic goiter has not lasted long enough in the goitrous areas to result in endemic cretinism. However, cretinism was endemic in many domestic animals in these areas before the diets of such animals were supplemented with iodine. Cretinism is simply myxedema of infancy. Added to the characteristic signs and symptoms of the disease are defects in the development of the skeleton and brain. There may be great disproportion between the two. In an older cretin the cerebration may be good and the development of the skeleton poor, or the reverse may be true. The skeleton can recover from a longer absence of thyroid secretion than the brain. The brain doubles in size during the first year of life by virtue of an increase in white matter, and an absence of thyroid function for only a few months results in permanent damage, the extent varying with the duration of the deficiency. On the other hand, a cretin may remain untreated until the age of 4 years and yet show growth of the skeleton to almost normal proportions. Differences in the susceptibility of the brain and skeleton to absence of thyroid function in the early years of life account for the marked discrepancies between mental and skeletal development observed in cretins.

It is obvious that early diagnosis is important, and yet it is difficult. At the time of birth the concentration of thyroxin in the child is normal if the concentration in the mother is normal. As previously shown, it then takes three months for the effects of absence of thyroid function to become evident. Determinations of metabolism in infants and young children are not satisfactory and are carried out in only a few clinics in this country. In most instances, before the diagnosis is made, irreparable damage has been done to the brain. Cretinism should be suspected at the first appearance of lethargy, constipation and failure to grow in length or to nurse properly. If treatment is instituted as soon as the signs and symptoms appear, almost completely normal development results. After the disease is well advanced, with appearance of the typical cretinoid facies, dry scaly skin and pot belly, the diagnosis is easy, but it is usually too late to make the child normal. Even then the diagnosis is often missed.

There is a great tendency to feed too large doses of thyroid, which produce nervousness, excessive perspiration and tachycardia and often lead to discontinuance of treatment for long periods. As a result, it is rare to see a cretin who has been treated continuously from the time the diagnosis was made. The dose of thyroid usually required varies from $\frac{1}{10}$ grain

2. Marine, David, and Lenhart, C. H.: *The Pathological Anatomy of the Human Thyroid Gland*, Arch. Int. Med. 7: 506 (April) 1911.

3. Salter, W. T.: *The Endocrine Function of Iodine*, Cambridge, Mass., Harvard University Press, 1940. Gutman, A. B.; Benedict, Ethel M.; Baxter, Blanch, and Palmer, W. W.: *The Effect of Administration of Iodine on the Total Iodine, Inorganic Iodine, and Thyroxine Content of the Pathological Thyroid Gland*, J. Biol. Chem. 97: 303 (July) 1932.

4. Thompson, W. O.; Thompson, P. K.; Taylor, S. G., III; Nadler, S. B., and Dickie, L. F. N.: *The Pharmacology of the Thyroid in Man*, J. A. M. A. 104: 972 (March 23) 1935.

5. Kendall, E. C.: *Thyroxine*, New York, Chemical Catalog Company, Inc., 1929. Thompson and others.⁴

6. Harington, C. R.: *The Thyroid Gland: Its Chemistry and Physiology*, New York, Oxford University Press, 1933. Thompson and others.⁴

(0.006 Gm.) of the U. S. P. material at 6 months to about 1 grain (0.064 Gm.) daily at the time of puberty. If the condition is not recognized for several years, the development of the brain may be so primitive that cerebral inhibition is lacking, and treatment may stimulate the patients so much that they may become very unruly. For this reason some cretins in institutions for the insane are untreated.

Prevention.—There is some evidence that animals with hypothyroidism are more liable to give birth to cretinous offspring than animals with normal thyroid function. It would therefore seem desirable to prevent conception in myxedematous women for several months after their thyroid function has been restored to normal and to watch their offspring carefully for the development of hypothyroidism. All women in goitrous areas should receive iodine throughout pregnancy.

MYXEDEMA

Myxedema denotes marked hypothyroidism in childhood and in adult life. It is more common in women than in men (4:1) and occurs most frequently during the fourth, fifth and sixth decades of life. The characteristic myxedematous appearance usually does not manifest itself until the metabolism drops to between —20 and —25 per cent. There are, however, a few striking exceptions to this rule. The cause is unknown in most instances, and the myxedema is spoken of as spontaneous. It may follow thyroidectomy, the spontaneous disappearance of exophthalmic goiter or an infection of the thyroid; in rare instances it may be produced by the preoperative or postoperative administration of iodine in patients with exophthalmic goiter. It is characterized by a slowing up of all reactions in the body, so that patients who have it become virtually hibernating. Outstanding among the manifestations are:

1. Puffiness of the face and eyelids, producing the typical myxedematous facies.
2. Swelling of the tongue and larynx, producing the typical hoarse, slow, slurred speech.
3. Dryness and roughness of the skin.
4. Falling out of hair all over the body, producing areas of alopecia (sometimes complete baldness), commonly almost complete absence of axillary and pubic hair, and sparseness and moth-eaten appearance of the eyebrows.
5. Poor memory, slowing of all mental reactions and dulness of the sensorium.
6. Constipation.
7. Reduction in basal metabolism.

In complete absence of thyroid function the basal metabolism drops to between —40 and —50 per cent, although all degrees of hypothyroidism are seen. All reactions that go on with a normal thyroid function also appear to go on in its absence, but at a slower rate. It takes between two and three months after the omission of treatment for the basal metabolism to drop to its lowest point, several more weeks or months for the characteristic myxedematous appearance to develop, and much longer for the changes in the skin and hair to reach their maximum. In some instances careful histories suggest that the disease may be present in early life in a form so mild it is not recognized and that under the stress and strain of living it gradually becomes more marked.

Too much emphasis has been placed on the supraclavicular pads of fat in the past. They are of no value in diagnosis. The thyroid hormone does not exercise a specific influence on fat metabolism; and hypo-

thyroidism is not to be regarded as a cause of obesity. The increased weight is caused largely by deposition of water, and patients rarely lose more than 20 pounds (9 Kg.) during treatment. The weight lost consists mostly of water containing nitrogen and electrolytes. Boothby and co-workers⁷ showed that the edema of myxedema is an albuminous deposit with about the composition of egg white.

Changes in the Blood.—In patients with myxedema any or all of the following changes may be present in the blood:

1. Secondary anemia, which is sometimes accompanied by eosinophilia and basophilia.
2. A decrease in the total quantity of circulating plasma.
3. An increase in the concentration of protein in the plasma.
4. A corresponding decrease in the concentration of water in the plasma.
5. A decrease in the concentration of chloride in the plasma and a corresponding increase in the concentration of bicarbonate, the total base usually remaining constant.

6. An increase in the concentration of cholesterol in the plasma.⁸

Changes in the Circulation.—The following changes are noted in the circulation:

1. A marked decrease in the minute volume of the heart and a prolongation of the circulation time. The opposite changes are noted in hyperthyroidism. These changes are associated with alterations in the mechanical work required of the heart and may represent adaptations of the circulation to variations in the demand for oxygen.

2. Myxedematous changes in the heart muscle, interfering with its efficiency. The transverse diameter of the heart is often increased, the sounds become weak, the pulse pressure drops, all of the complexes in the electrocardiogram are reduced in amplitude, and the T waves in leads 1, 2 or 3 may be inverted. The change in the heart muscle may so interfere with cardiac efficiency that decompensation develops, with characteristic pitting edema of dependent portions of the body (so-called myxedema heart). The decompensation and edema in this condition do not clear up with digitalis but promptly disappear with thyroid.

Difference Between Myxedema and Cardiac Edema.—In myxedema there is general increase in intracellular water. When pitting develops it usually is the result of superimposed cardiac edema. In cardiac edema there is marked increase in intercellular water, chiefly in dependent portions of the body. It is not associated with the increased deposition of protein seen in patients with myxedema.

Changes in the Cerebrospinal Fluid.—In myxedema there is usually a well marked increase in the concentration of protein in the cerebrospinal fluid, while the opposite change is observed with toxic goiter.⁹ Values as high as 300 mg. per hundred cubic centimeters have been observed in cases of myxedema, compared with the normal of 25 to 40 mg. per hundred cubic centi-

7. Boothby, W. M.; Sandiford, I.; Sandiford, K., and Slosse, J.: The Effect of Thyroxin on the Respiratory and Nitrogenous Metabolism of Normal and Myxedematous Subjects: I. A Method of Studying the Reserve or Deposit Protein with a Preliminary Report of the Results Obtained, *Tr. A. Am. Physicians* 40: 195, 1925.
8. Hurxthal, L. M.: Blood Cholesterol in Thyroid Disease: II. Effect of Treatment, *Arch. Int. Med.* 52: 86 (July) 1933.
9. Thompson, W. O.; Thompson, P. K.; Silveus, E., and Dailey, M. E.: The Protein Content of the Cerebrospinal Fluid in Myxedema, *J. Clin. Investigation* 6: 251 (Oct.) 1928.

meters. No other significant change has been noted in the fluid. The high concentration of protein in the cerebrospinal fluid, like that of the cholesterol in the blood, is sometimes of diagnostic value, especially in regard to cretins, although the values for both vary too much for purposes of routine diagnosis. The cerebrospinal fluid findings in myxedema resemble those in some cases of brain tumor and are similar to those in diabetes mellitus.

Changes in Calcium Metabolism.—In hypothyroidism the urinary excretion of calcium is diminished, and the bones sometimes show an increase in density, whereas in hyperthyroidism the opposite changes are noted.¹⁰ In rare instances the decalcification of the skeleton in toxic goiter is so marked that spontaneous fractures occur. These alterations in the metabolism of calcium in thyroid disease occur without corresponding changes in the concentration of calcium in the serum, in contrast to the changes in hypoparathyroidism and hyperparathyroidism.

Sexual Changes.—There is commonly decrease in libido, decrease in axillary and pubic hair and often sterility. The menstrual history is variable. The flow may be excessive, simulating incomplete abortion; there may be scantiness of menstruation with prolongation of the intermenstrual period, or there may be complete absence of menstruation. In hyperthyroidism there is often scantiness of menstruation with or without prolongation of the intermenstrual periods.

Pathologic Anatomy.—The gland is usually largely replaced by scar tissue. In some instances, however, a goiter is actually present, suggesting either inadequate stimulation of the thyroid or enlargement of a diseased gland in an attempt to supply an adequate amount of secretion. The gland in such a patient may enlarge during the period of myxedema and decrease in size when thyroid is administered. There is some separation of the fibers of skeletal and cardiac muscles and of the cells of the skin by the myxedematous condition.

Differential Diagnosis.—Myxedema may be confused with chronic nephritis, Simmonds's disease and pernicious anemia. In both myxedema and chronic nephritis there may be secondary anemia, hypertension and some albuminuria. However, the typical myxedematous appearance is absent in patients with chronic nephritis. In nephrosis the basal metabolism may be as low as in myxedema, but the marked general pitting edema, the reduction in the concentration of protein in the serum, the reversal of the albumin-globulin ratio, the marked albuminuria and the absence of the myxedematous facies make it comparatively easy to distinguish the two diseases. In Simmonds's disease there may be marked lowering of the basal metabolism and amenorrhea, but the cachexia and the absence of the myxedematous appearance and of roughness and dryness of the skin usually make it possible to exclude myxedema. In pernicious anemia the lemon yellow tint of the skin, the characteristic blood findings and the absence of the myxedematous facies readily make it possible to exclude myxedema. In rare instances the two diseases coexist, and then appropriate treatment must be given for each.

As the use of basal metabolism apparatus becomes more widespread, there is a tendency for hypothyroidism to be detected in its early stages more commonly

than before. However, the diagnosis of myxedema is still often not made until the disease is well advanced and then only when the patient visits a special clinic. Alterations in the basal metabolism must be correlated with the clinical picture. There are patients with basal metabolism of —20 to —25 per cent who do not appear myxedematous and who are not improved by the administration of thyroid. The cause of the low basal metabolism in them is obscure.

In Addison's disease there is often moderate depression of the basal metabolism, and in rare instances myxedema is present. Patients are often improved by the administration of thyroid, but it is not known at present whether the adrenal cortex affects the thyroid directly or indirectly.

TREATMENT OF PRIMARY HYPOTHYROIDISM

The following directions and considerations are important in the management of the primary type of hypothyroidism:

1. Administer the minimum amount of desiccated thyroid necessary to maintain a normal level of metabolism. The average dose required for maintenance in thyroidless adults is from $1\frac{1}{2}$ to 2 grains (0.096 to 0.128 Gm.) of thyroid U. S. P. (0.18 to 0.23 per cent iodine) daily. In cretins, as previously stated, the dose varies from $\frac{1}{10}$ grain at the age of 6 months to 1 grain daily at the age of puberty.
2. Begin with an inadequate dose (1 grain daily in most adults under 40 years of age) and increase the amount gradually after several weeks until the correct amount is being administered.
3. Avoid a large initial dose in all cases, particularly if the patient shows arteriosclerosis and coronary disease, because of the danger of precipitating coronary thrombosis. For such a patient the initial dose should not exceed $\frac{1}{2}$ grain (0.032 Gm.) daily. If angina develops during treatment, the metabolism should be adjusted at a somewhat subnormal level. Besides coronary accidents, the administration of large initial doses of desiccated thyroid or of thyroxin, as advocated in some clinics, may produce symptoms of thyroid intoxication, including aching and marked tenderness of muscles, sometimes a fever (as high as 104 F.), occasionally nausea and rarely vomiting. By raising the metabolism slowly, these unpleasant symptoms are avoided and the danger of accidents is greatly minimized.
4. Make changes in the dose slowly, because of the slow adjustment. At least two months is required for complete adjustment to any dose.
5. In recording the dose of thyroid always state the iodine content.
6. Do not expect thyroxin to revive untreated patients after they have become almost moribund; the action of the drug is too slow. Such an emergency should be prevented by early treatment.
7. Do not administer thyroxin intravenously except in the rare instances in which there is a question whether or not the patient is taking the dose of thyroid prescribed. Thyroxin works well when given in alkaline solution by mouth but possesses no advantage over desiccated thyroid.

When secondary anemia is present, it is usually not corrected by the administration of thyroid alone but requires in addition the administration of large doses of iron.

Extravagant claims are made for various preparations of thyroid from which the toxic material is supposed to have been removed. In my experience these claims

10. Aub, J. C.; Bauer, Walter; Heath, Clark, and Ropes, Marion: *Studies of Calcium and Phosphorus Metabolism*. III. The Effects of the Thyroid Hormone and Thyroid Disease, *J. Clin. Investigation* 7:97 (April) 1929.

have appeared to be without foundation: such preparations have possessed no advantage over desiccated thyroid. As a matter of fact, all of the symptoms of intoxication associated with the administration of large doses of desiccated thyroid have been associated also with the administration of the pure substance, thyroxine.

TREATMENT OF SECONDARY HYPOTHYROIDISM

The treatment of secondary hypothyroidism is also best carried out at present by the administration of thyroid, although this represents only part of the treatment. In the patient with hypopituitarism the thyroid may be stimulated by administering the thyrotropic factor of the pituitary, but, apparently because of development of immunity, the effect lasts only a few weeks even though the treatment is continued. Some improvement in the stimulation type of treatment may be expected with improvement in anterior pituitary extracts.

LOW BASAL METABOLISM WITHOUT MYXEDEMA

Reference has already been made to a group of patients with low basal metabolism in whom the administration of thyroid does not produce improvement. In the interpretation of the low rates in such patients it may be pointed out that the total metabolism may be altered in a variety of ways which do not involve any change in thyroid function. The increases effected by epinephrine, muscular exercise, dinitrophenol, dinitroorthocresol and diiodothyronine occur too quickly to be the result of any change in thyroid function. In a patient with myxedema the metabolism may be raised to normal with dinitrophenol or dinitroorthocresol without any change in the myxedematous condition.⁴ The possibility must therefore be entertained that some unknown factor or factors outside the thyroid may directly affect oxidation. In some persons normal thyroid function may be present in spite of basal metabolism 20 to 25 per cent below normal. In such persons a normal level of metabolism would represent a thyrotoxic one. These considerations may explain occasional instances in which clinical relief from thyrotoxicosis appears to have been associated with a reduction of the basal metabolism from a standard normal to a low level. However, the greatest caution must be exercised in the interpretation of all such apparent instances of improvement if needless thyroidectomy is to be avoided.

Unless the basal metabolism is depressed more than 25 per cent below normal, myxedema is usually not present and the symptoms are indefinite, making it difficult to tell by the clinical picture alone whether or not hypothyroidism is present. A therapeutic test with thyroid must therefore be made. Hypothyroidism of either the primary or the secondary type may be considered to exist in a patient with low basal metabolism when clinical improvement is produced by raising the basal metabolism to normal. When no improvement occurs, it may be concluded that hypothyroidism is not present and that the administration of thyroid is futile.

TOXIC GOITER

There is some question as to whether or not there are two types of toxic goiter. Plummer¹¹ attempted to differentiate two types (exophthalmic goiter and toxic adenoma) on the basis of function. According to his hypothesis, there is with toxic adenoma simple hyperthyroidism, whereas with exophthalmic goiter

there is simple hyperthyroidism plus production of an abnormal product. This abnormal product, which he thought might be a deficiently iodinated thyroxine, accounted for the peculiar emotional instability with exophthalmic goiter, which distinguished it from toxic adenoma. Up to the present time, observations on the calorogenic and clinical effects of compounds closely related to thyroxine (notably thyronine and diiodothyronine) have not supported Plummer's hypothesis. There do, however, appear to be certain differences between the two diseases. In the patient with exophthalmic goiter the goiter and the thyrotoxic symptoms usually appear abruptly at about the same time, whereas in the patient with toxic adenoma the thyrotoxic symptoms commonly appear insidiously after goiter has been present for several years (fourteen and a half years on the average).¹² In general, emotional instability is more marked in patients with symmetrically enlarged goiters than in patients with nodular goiters.

The terms used to denote the types of toxic goiter are misnomers. This is particularly true of the syndrome described as exophthalmic goiter, which may be present in a patient without a goiter and without exophthalmos. However, even though the thyroid is not enlarged, it is usually firmer than normal. To produce descriptive terms that are more accurate, the American Association for the Study of Goiter has proposed that "symmetric toxic goiter" and "nodular toxic goiter" be substituted for "exophthalmic goiter" and "toxic adenoma," respectively. Similarly, they have suggested that simple goiter and nontoxic adenoma be called "symmetric nontoxic goiter" and "nodular nontoxic goiter," respectively.

Cause.—The cause of toxic goiter is not known. Among the most plausible possibilities are overproduction of the thyrotropic factor by the anterior lobe of the pituitary, some disorder of the sympathetic nervous system, a disturbance of some center controlling thyroid function in the base of the brain and some abnormality inherent in the thyroid itself. Great attention has been focused in recent years on the interrelations of the thyroid and the pituitary.¹³ It is definitely established that integrity of thyroid function is dependent on integrity of pituitary function and that hypothyroidism and hyperthyroidism may be secondary to corresponding states in the anterior lobe of the pituitary, e. g., chromophobe adenoma and acromegaly, respectively. In acromegaly the basal metabolism may show a reduction during the administration of iodine just as in exophthalmic goiter. In patients with normal or slightly depressed basal metabolism all of the symptoms of toxic goiter except exophthalmos may be produced by administration of an anterior pituitary extract containing the thyrotropic factor.¹⁴ The severity of toxic goiter may be increased in the same manner. The thyrotropic factor is inert in the absence of thyroid tissue capable of function. However, in spite of all these convincing observations, there is so far no positive proof that the pituitary is concerned in the clinical disorder of toxic goiter.

Incidence with Regard to Age and Sex.—Exophthalmic goiter occurs most frequently in persons between

11. Plummer, H. S.: The Clinical and Pathologic Relationships of Hyperplastic and Non-Hyperplastic Goiter, *J. A. M. A.* 61: 650 (Aug. 30) 1913.

12. Haines, S. F.: Adenomatous Goiter with Hyperthyroidism, *Tr. Third Internat. Goiter Conf. & Am. A. Study Goiter*, 1938, p. 198.

13. Collip, J. B.: Inhibitory Hormones and Principle of Inverse Response, *Ann. Int. Med.* 8: 10 (July) 1934. Uhlenhuth, E.: Thyroactivator Hormone: Its Isolation from Anterior Lobe of Bovine Pituitary Gland and Its Effects on Thyroid Gland, *Tr. Am. A. Study Goiter*, 1936, p. 25.

14. Thompson, W. O.; Thompson, P. K.; Taylor, S. G., III, and Dickie, L. F. N.: The Influence of the Pituitary in Thyroid Disease, *West. J. Surg.* 47: 4 (Jan.) 1939.

the ages of 15 and 50.¹⁵ Both types of toxic goiter are more common in women than in men, in the proportion of 4 or 5 to 1. The sex ratio varies from place to place and from time to time and to some extent with age, the difference in incidence in the two sexes being less marked in the very young and the very old. The cause for the greater frequency of the disease in women is unknown.

Pathologic Anatomy.—In exophthalmic goiter the gland is characterized by papillary projections into the acini, decrease in the amount of colloid and in the iodine content and often by increase in the lymphoid tissue between the follicles. These changes are associated with increase in the concentration of iodine in the blood and increase in the excretion of iodine in the urine.¹⁶ In some instances thick bands of fibrous tissue are observed throughout the gland, and the capsule may be adherent to surrounding tissues. Often there is proliferation of lymphoid tissue throughout the body, together with persistence of the thymus. According to Warthin, certain persons are born with this so-called thymicolymphatic, or Graves' constitution and are predisposed to the development of toxic goiter. Relative lymphocytosis in the blood has been described and much was made of it by Kocher. When iodine is administered, the papillary projections decrease or disappear, the colloid and iodine content of the gland increase, and the organic iodine content of the blood decreases. These changes are usually associated with decrease in the basal metabolism. The mechanism of the action of iodine is unknown. In a few instances the response to iodine may be reversible, the administration of inadequate doses being associated with increase in basal metabolism and the administration of adequate doses immediately afterward with decrease.¹⁷ The minimum dose of iodine that would produce any effect in most patients in Boston was about 0.75 mg. per day, and the minimum dose that would produce a maximum effect was about 6.0 mg. per day. For some patients a larger dose is required to produce a maximum effect. In Chicago as much as 24.0 mg. per day has been necessary in some patients.

It has been pointed out by Marine² that the histologic structure of the thyroid and its response to iodine are the same in simple goiter and in exophthalmic goiter. In the individual nodules of glands with toxic adenoma the same changes may be observed as are seen in glands with exophthalmic goiter, but they are not so characteristic. In toxic adenoma the goiter is commonly of long standing, and various degenerative changes are seen, including thick bands of scar tissue, colloid degeneration, hemorrhage and formation of cartilage and bone.

Signs and Symptoms.—The more common signs and symptoms of toxic goiter are:

1. Goiter (absent in rare instances, although the gland is always firmer than the normal)
2. Nervousness
3. Tremor
4. Tachycardia
5. Palpitation

6. Dyspnea
7. Loss of weight
8. Increase in basal metabolism
9. Exophthalmos (in about from 60 to 70 per cent of patients with exophthalmic goiter)
10. Various other ocular signs, the most important being puffiness of the eyelids, lid lag (von Gräfe) and poor convergence (Möbius)
11. Systolic thrill and bruit, usually most marked over the superior poles (not present in adenomatous goiter)
12. Emotional instability
13. Muscle weakness
14. Early fatigue
15. Increased perspiration
16. Diarrhea (in about one third of the cases, usually the more severe ones)
17. Pressure symptoms (one quarter of the cases)
18. Nausea and vomiting (rare and unfavorable signs)

Crisis.—Sometimes in either the treated or the untreated disease a condition known as a crisis develops. A crisis is characterized by loss of appetite, nausea, vomiting, gradually increasing heart rate, marked weakness, loss of weight and sometimes by diarrhea and fever. If no treatment has previously been given, a crisis can often be controlled by administration of iodine, but this condition may appear during treatment or fail to respond to all known therapeutic measures and result in the death of the patient before operative procedures can be carried out. A crisis may develop during the postoperative period and under these circumstances usually indicates inadequate preoperative preparation. In a crisis the cause of the disease is presumably acting with great intensity.

Differential Diagnosis.—Toxic goiter may have to be distinguished from nontoxic goiter, neurocirculatory asthenia, emotional disturbances from other causes, acromegaly and pulmonary tuberculosis. In nontoxic goiter, neurocirculatory asthenia and emotional disturbances from causes other than thyrotoxicosis, the basal metabolism is normal. In the patient with simple goiter the thyroid gland is softer than that of the patient with toxic goiter, and a bruit is usually not heard. In acromegaly there may be a goiter, high basal metabolism and exophthalmos, but the characteristic skeletal changes readily make it possible to distinguish the two diseases. The roentgenologic findings, fever and poor appetite readily distinguish pulmonary tuberculosis, which does not very often present a problem in diagnosis. In the leukemias and polycythemia vera the metabolism may be elevated, but these diseases rarely present problems in diagnosis.

Whenever there is any doubt about the diagnosis, it is important to determine (1) the level of the basal metabolism and (2) the effect of administration of iodine on this level.

Treatment.—There are three ways of treating toxic goiter: (1) by subtotal resection of the gland after suitable preparation of the patient, (2) by roentgen irradiation of the gland and (3) medically (chiefly by iodine and rest).

It is generally agreed that subtotal resection of the gland after suitable preparation of the patient represents the best method of treatment.¹⁸ Treatment, therefore, involves an intelligent combination of surgical and medical measures. Roentgen ray therapy is valu-

15. Means, J. H.: *The Thyroid and Its Diseases*, Philadelphia, J. B. Lippincott Company, 1937.

16. Curtis, G. M., and Puppel, I. D.: *The Iodine Metabolism in Thyroid Disease*, Tr. Third Internat. Goiter Conf. & Am. A. Study Goiter, 1938, p. 367.

17. Thompson, W. O.; Thompson, P. K., and Cohen, A. C.: *The Range of Effective Iodine Dosage in Exophthalmic Goiter: IV. The Effect on Basal Metabolism of the Daily Administration of About 0.75 Mg. of Iodine*, Arch. Int. Med. 49: 199 (Feb.) 1932.

18. Lahey, F. H.: *Surgery in Hyperthyroidism*, Tr. Third Internat. Goiter Conf. & Am. A. Study Goiter, 1938, p. 297.

able in a few selected cases in which operation is contraindicated, but its results are too delayed and too uncertain to make it practical in most instances. In a few cases in which the symptoms are mild the disease may be held in check by iodine alone until it disappears, but this form of treatment must be carried out with the greatest care because the disease is characterized by remissions and relapses and a mild form of the disease may at any time become a severe one.

The outcome of operation is determined by the condition of the patient at the time of operation and by the skill of the surgeon. Both factors are important, but our data indicate that the condition of the patient is the more important.¹⁹ The operation is an elective one and should be carried out only when the condition of the patient justifies this. As already pointed out, postoperative crises usually mean inadequate preoperative preparation. Thyroidectomy is never an emergency operation and when done as such commonly results in the death of the patient. With some patients it may be necessary to take several months for adequate preparation. The preoperative management should be carried out in the medical service of a hospital by a specially trained internist. The internist should continue his observation of the patient in the immediate postoperative period as well as later, because many of the problems that arise are medical in nature.

The following points are important in preparing patients for operation:

1. The diet administered should be sufficiently high in calories to produce a gain in weight (usually 4,000 to 5,000 calories daily).

2. The condition of the patient must be improved by the administration of iodine. Within wide limits the size of the dose and the form in which it is administered are not important. For routine purposes it is desirable to administer 5 minims (0.3 cc.) of compound solution of iodine or 1 grain (0.06 Gm.) of sodium or potassium iodide three times a day. It used to be thought that operative procedures should be carried out as soon as the basal metabolism showed its maximum reduction during the administration of iodine, because of the danger of a serious exacerbation of the disease with continued administration. The danger of this occurrence has been greatly exaggerated, and it is well established that maximum clinical improvement from iodine does not necessarily coincide with maximum reduction in basal metabolism. My associates and I rarely recommend operative procedures until about one week has elapsed after the time of maximum reduction in basal metabolism and do not hesitate to delay operation as long as is necessary to improve the condition of the patient.

3. Rest is very important, but patients must not be confined to bed. Some activity should be allowed and encouraged in order to preserve muscle tone, except in the presence of a crisis or of cardiac decompensation. Patients should be prepared in the hospital, away from the stress and strain of the home environment.

4. Roentgen ray treatment should be considered for patients with high metabolic rates refractory to iodine.

5. Patients with cardiac decompensation should be conditioned for operation by the administration of digitalis.

It is usually unwise to operate when:

1. The patient fails to gain or is losing weight.
2. Emotional instability and muscle weakness are pronounced.
3. The basal metabolism is plus 60 per cent or higher in spite of the administration of iodine.
4. The disease is increasing rapidly in severity.
5. Less than two weeks has elapsed since an infection of the upper respiratory tract cleared up.
6. Cardiac decompensation is present.

Each patient presents an individual problem, and there are, of course, exceptions to these rules. For example, often, if a patient is gaining weight steadily, we do not hesitate to operate even though the basal metabolism remains 60 or 70 per cent above normal in spite of the administration of iodine. Gain in weight is the single most important sign in gauging the risk of operation. With it there are usually a reduction in emotional instability and an increase in strength. Whenever there is any doubt, it is best to err on the side of conservatism. Operation can always be delayed, but after a postoperative crisis has set in, often nothing will stop it. Unless cardiac decompensation is present, the criteria of operability are the same in the presence of organic heart disease as in its absence.

When the patient cannot be prepared properly by the procedures outlined, sufficient improvement to justify the carrying out of operative procedures may be produced by roentgen ray treatment of the thyroid (eight to twelve treatments given at weekly intervals).

Immediate Preoperative Preparation.—It is important:

1. To make a careful search for an infection of the upper respiratory tract just before the patient goes to the operating room.

2. To administer a carbohydrate meal from six to eight hours before operation, to prevent the development of acidosis in the postoperative period.

3. To administer the regular dose of iodine with this meal.

4. To institute, twenty-four hours before the scheduled time of operation, some program suitable for the control of emergencies when the disease is complicated by diabetes.

Immediate Postoperative Treatment.—It is important:

1. To observe the wound carefully for early detection of excessive bleeding.

2. To observe the patient carefully to detect respiratory difficulty as soon as it arises, either from laryngeal or from tracheal obstruction. When only one vocal cord is paralyzed, serious respiratory difficulty usually does not develop.

3. To secure the services, for the first forty-eight hours, of a specially trained nurse who will report trouble as soon as it arises.

4. To have available facilities for emergency passage of a life-saving tube and performance of a tracheotomy. A tracheotomy is rarely necessary, but when it is necessary it usually has to be done in a hurry.

5. To administer intravenously a suitable combination of salt and dextrose for prolonged or excessive vomiting, a thyroid crisis or a circulatory collapse (1 liter of 5 per cent dextrose in physiologic solution of sodium chloride every six hours).

6. To administer iodine until the patient's discharge from the hospital, to control any residual thyrotoxicosis.

19. Thompson, W. O.; Taylor S. G., III; Meyer, K. A., and McNealy, R. W.: Experiences in Treating Toxic Goiter in a Large Public Hospital, *Ann. Int. Med.* 12: 217 (Aug.) 1938.

7. To search for parathyroid tetany on the second to the fourth postoperative day and, if observed, to control it with suitable measures.

In most instances it is desirable to allow patients out of bed within twenty-four to forty-eight hours after thyroidectomy, to prevent their becoming bedridden and to shorten their postoperative course.

Deaths.—By the application of the principles outlined, my associates and I¹⁰ were able to reduce the operative mortality at the Cook County Hospital during the period from 1932 to 1937 from 10.8 to 1.6 per cent. About 40 per cent of the deaths in our series were caused by sudden respiratory difficulty, about 30 per cent by pneumonia and about 20 per cent by crises. However, after 1934 there was not a single death from a crisis, a fact which we attribute to more adequate preoperative preparation of the patients. The deaths from sudden respiratory difficulty were usually associated with bilateral paralysis of the vocal cords with or without pressure on the recurrent laryngeal nerves from hard blood clots under the strap muscles, and in one instance death was caused by pressure from a hematoma on a collapsible trachea. Preoperative infections of the upper respiratory tract appear to play an important role in the development of postoperative pneumonia.

Results of Treatment.—Following subtotal thyroidectomy the basal metabolism in about 70 per cent of cases drops to normal in from ten to fourteen days and remains normal for the rest of the patient's life. In about 20 to 25 per cent of cases it finally drops to a subnormal level, although the development of complete myxedema is rare. In about 5 to 10 per cent of cases the disease persists or recurs. A true recurrence is rare; in most cases postoperative thyrotoxicosis represents persistence of the disease.

Most patients showing low basal metabolism are improved by the administration of thyroid. The treatment of the persistent or recurrent disease is the same as that of the untreated disease, unless some complication, such as paralysis of a vocal cord, makes it undesirable to carry out further operative procedures. Two points are important in determining whether or not the disease has been eliminated by operation:

1. A basal metabolic rate of plus 15 per cent or higher during the administration of iodine from ten to fourteen days after operation usually means that the disease has not been abolished. On the other hand, if the basal metabolism is normal from ten to fourteen days after operation and iodine is being administered, it is uncertain whether the disease is still present or not.

2. If the basal metabolism remains within normal limits for as long as two months without the administration of iodine, a cure can almost be assured.

SIMPLE GOITER

In simple goiter there is symmetric enlargement of the thyroid, usually associated with no disturbance of function, although in some instances there is mild hypothyroidism. Like most thyroid diseases, it is more common in women than in men and is more common during periods of increased stress on the thyroid, namely, at puberty and during pregnancy. As the incidence in the population increases, the ratio of male to female patients increases. The response of simple goiter and exophthalmic goiter is the same histologically to administration and withdrawal of iodine, but the causes of the two diseases are entirely different. Simple goiter is not commonly a precursor of exophthalmic goiter. The cause of exophthalmic goiter is unknown. The

most important cause of simple goiter is a deficiency of iodine. Other factors are involved in this type of goiter. Its production in a variety of ways and the greater susceptibility of some persons as demonstrated by its tendency to occur in families are consistent with this point of view. However, most of the causes appear to act by rendering iodine unavailable to the thyroid. Iodine is very effective in the prevention of simple goiter, and there is a close parallelism between the iodine content of the soil and the incidence of simple goiter in various parts of the world.²⁰ The incidence has been high in the Himalayan Mountain regions of South Central Asia; the Alpine, Pyrenean and Carpathian Mountain regions of Europe; the Andean Plateau and Southeastern Brazil in South America; while in North America its incidence has been high in the St. Lawrence River Basin and Great Lakes district, the Dakotas and adjacent Canadian provinces, and the Pacific Northwest including Oregon, Washington and British Columbia.

Pathologic Anatomy.—The histologic picture of the gland depends largely on the duration of the iodine deficiency. When the gland is subjected to an adequate supply of iodine, it first uses up the iodine it has stored in its own colloid. Marine and Lenhart² have shown that when the iodine content of the gland drops below 1 mg. per gram of dried gland, papillary projections into the acini appear, and the epithelium begins to change from columnar to cuboidal. The extent of these changes depends on the degree of depletion of colloid. A similar quantitative relationship is observed in patients with exophthalmic goiter. According to Marine and Lenhart,² the gland increases in size in a steplike fashion. After a period of hyperplasia, the subject may receive a supply of iodine, whereupon the gland stores colloid, the papillary projections disappear, the epithelium reverts to cuboidal form and the gland is in a resting or involutional stage. Then again come a deficiency and an abundance of iodine, and the cycle is repeated. These pathologic considerations readily explain why in the treatment of simple goiter the gland usually does not decrease in size. In fact, at first it may increase in size and then remain stationary. Prevention of further increase in size is all that can be promised from treatment. However, in rare instances a marked regression in size does occur under the influence of iodine. Another type of change may occur. Groups of acini may become much more distended with colloid than surrounding acini, which become compressed and disintegrate and are replaced by scar tissue forming a nodule surrounded by a capsule. Wegelin and Rienhoff have suggested that many nodules appear in this way, and it would seem that the development of adenomatous goiter is commonly an end result of simple goiter.

Treatment.—An effort should be made to cause a reduction in size by first giving a large excess of iodine (5 minims of compound solution of iodine or 1 grain of potassium iodide or sodium iodide daily) for two or three months. If no reduction in size occurs, a much smaller dose should be administered, such as the amount in iodized salt or 1 minim (0.06 cc.) of compound solution of iodine once a week. If there is associated hypothyroidism, a marked decrease in the size of the goiter may occur during the administration of desiccated thyroid.

20. McClelland, J. F.: *Iodine and the Incidence of Goiter*, New York, Oxford University Press, 1939.

Instead of giving iodine in small daily doses, Marine and Kimball²¹ have shown that it is possible to prevent simple goiter by giving an excess of iodine for two or three weeks twice a year. The explanation for this is simple. The storage capacity of the thyroid for iodine is about 5 mg. per gram of dried gland, or a total of about 25 mg. for the average normal thyroid. If all of this iodine were available for the production of thyroxin, it would yield 37.5 mg. of thyroxin, which is enough to maintain normal thyroid function for one hundred and fourteen days. On the same basis, a second period of excess of iodine would result in the formation of a normal supply of the thyroid hormone for a total of two hundred and twenty-eight days. The additional iodine in the food and water would in most instances be adequate for maintaining normal thyroid function throughout the year.

Prophylaxis.—It is more important to prevent simple goiter than to treat it after it has developed. This is best done by the universal use of iodine in goitrous areas, preferably in the form of iodized salt. It has been previously pointed out that the iodine requirement of the normal thyroid probably does not exceed 0.2 mg. daily. The iodized salt used in this country contains about 200 mg. of iodine per kilogram (0.02 per cent), which would mean that a person who takes 5 Gm. of salt daily would get 1 mg. of iodine. This amount may be greater than is necessary. The iodized salt used in Switzerland contains only one fortieth of this amount and yet has proved effective except at puberty and during pregnancy. Marine has advocated the use of salt containing 10 mg. of iodine per kilogram, one twentieth of the amount now being used. More work needs to be done in this country on the prophylactic value of doses of iodine smaller than are now being used.

Importance of Prophylaxis.—Goiter presents a problem on every continent and affects not only man but also domestic animals. The prevention of simple goiter means the elimination of endemic cretinism, which in the past has caused great economic loss in both man and domestic animals. Its prevention also means a great reduction in the incidence of nontoxic adenoma and therefore presumably of toxic adenoma and of carcinoma. It therefore represents a public health problem of the first magnitude in many parts of the world.

NONTOXIC ADENOMA (NODULAR NONTOXIC GOITER)

Adenoma of the thyroid may develop at any point from the base of the tongue to the diaphragm. The growths vary in size from microscopic nodules to nodules many centimeters in diameter, are commonly multiple and, as a rule, lie in the usual location of the thyroid. Some substernal extension is common. Occasionally the whole adenomatous goiter lies in the mediastinum, and rarely a substernal nodule is encountered with the remainder of the thyroid in the usual location.

The diagnosis rarely presents any problem except when the goiter is confined to the substernal space or when thyroid nodules are confused with parathyroid nodules.

Pathologic Anatomy.—The most common type of adenoma is that arising in simple goiter. In this type of goiter the hyperplastic and colloid phases (colloid adenoma) of simple goiter are encountered. Various types of degenerative changes may be observed in

goiters of long standing. Several acini may become greatly distended with colloid; their walls may rupture and coalesce, giving rise to large gelatinous masses. Thick bands of scar tissue, hemorrhage and formation of cartilage and bone are also noted.

Nodules may arise from fetal rests. These are of two types. One contains columns of cells (embryonic adenoma) and the other small, closely packed acini (fetal adenoma). It has been suggested that the more undifferentiated the type of cell in an adenoma the more malignant the carcinoma arising from it.

Treatment.—Routine removal of all nodules of the thyroid has been suggested in some quarters in order to prevent development of carcinoma and prevent toxic adenoma. Among persons past the age of 45, thyrotoxicosis develops in about 1 in 4 and carcinoma in about 1 in 200. If all nodules were routinely removed, the mortality, except in leading centers, would probably be higher than the mortality from carcinoma. The incidence of tetany (less than 1 per cent) and of paralysis of the vocal cords (perhaps 5 per cent) must also be taken into consideration. In the best hands, it is probably justifiable to remove all nodules routinely. In any event, it is desirable to remove all nodular goiters with any substernal extension, all those which have recently increased in size, all those that are very large, those which produce pressure symptoms and those which are accompanied by enlargement of the lymph glands in the neck. Subtotal thyroidectomy should be done even though there appears to be only a single nodule, because there are commonly smaller nodules (often microscopic) throughout the gland. When the enlargement is slight, it is perhaps best to let the patient himself make the decision, after all the facts have been placed before him. If he is carefully followed, thyrotoxicosis can be detected as soon as it appears, further enlargement can usually be prevented by the administration of iodine, and he may wish to run the risk of carcinoma development.

ANOMALIES OF DEVELOPMENT

Anomalies of development can readily be understood if the embryologic origin of the thyroid as an evagination of the primitive pharynx is borne in mind.²² The thyroid tissue may fail to descend in whole or in part or may migrate to too low a level. Thus, it may be found in the nasopharyngeal, lingual, intralingual, sublingual, prelaryngeal, intratracheal, intraesophageal and mediastinal areas, and in very rare instances, as low as the diaphragm (goiter plongeant). The origins of lingual goiters, pyramidal lobes and substernal goiters are thus readily accounted for. Thyroglossal cyst is readily accounted for by the thyroid cells, in their descent, carrying down some pharyngeal cells, which give rise to a cyst. Such a cyst may communicate with the pharynx by way of the thyroglossal duct, which has failed to obliterate as it does during normal development, and with the skin through a permanent fistulous opening produced by spontaneous rupture or surgical incision. Such an opening is in the midline between the isthmus of the thyroid and the hyoid bone. There is some difference of opinion about the origin of lateral aberrant thyroid tissue. According to some observers, it arises from thyroid cells which come from the so-called fifth branchial pouch (ultimobranchial body).²³ According to hypothesis, these cells normally

22. Norris, E. H.: The Early Morphogenesis of the Human Thyroid Gland, *Am. J. Anat.* 24: 443 (Nov.) 1918.

23. Leech, J. V.; Smith, L. W., and Clute, H. M.: Aberrant Thyroid Glands, *Am. J. Path.* 4: 481 (Sept.) 1928.

21. Marine, David, and Kimball, O. P.: The Prevention of Simple Goiter in Man, *J. Lab. & Clin. Med.* 3: 40 (Oct.) 1917.

descend and fuse with the anlage from the pharynx but take no part in the formation of the parenchyma of the thyroid. Failing to descend they may give rise to embryonic rests, which later develop into lateral aberrant thyroid tissue. This gives rise to tissue of a low grade of malignancy, which is usually of the nature of papillary cystadenoma. According to other observations, lateral aberrant thyroid tissue arises by separation from the main body of the thyroid. In rare instances thyroid tissue is found in teratoma, especially in the ovary. The thyroid tissue in teratoma may function. There is an instance on record in which it was responsible for the symptoms of exophthalmic goiter.

THYROIDITIS

Thyroiditis is a rare disease and may be acute, subacute or chronic and may be suppurative or non-suppurative.²⁴ It may arise from a distant focus of infection or from a focus in neighboring structures of the neck. Infection may be introduced at the time of operation and give rise to postoperative thyroiditis. Any organism may infect the gland. The milder forms of infection may go unrecognized. Redness, swelling and tenderness of the skin over the thyroid, together with fever, suggest the presence of thyroiditis. Recurrent attacks of the noninflammatory variety may be noted, although one attack may completely destroy the gland and result in the development of myxedema. Tuberculosis of the gland is very rare and always secondary to tuberculosis elsewhere. Infection with pyogenic organisms may result in single or multiple abscesses or suppuration of the whole gland, usually associated with fever and often with a sudden onset. Abscesses should be drained because of the danger of spread of an infection into the mediastinum and along the fascial layers of the neck. Abscesses of the thyroid may compress the trachea, and relief may follow tracheotomy. The redness, swelling, tenderness and fever that sometimes accompany necrosis of thyroid tissue in patients with carcinoma may lead to a mistaken diagnosis of thyroiditis. The end result of thyroiditis is usually hypothyroidism, the extent of which is related to the amount of gland destroyed.

Struma lymphomatosa²⁵ and Riedel's struma are classified under the heading of chronic thyroiditis. Struma lymphomatosa occurs in older people and almost entirely in women. It is characterized by a rapid, firm swelling of the gland. It is usually bilateral, and the shape of the gland conforms more or less to the normal contour. The gland is hard and divided into lobules by dense bands of fibrous tissue. It shows numerous areas of lymphoid tissue with germinal centers and a few multinuclear giant cells. The gland may compress the trachea, although tracheotomy is rarely necessary. Subtotal thyroidectomy is indicated.

In Riedel's struma there is rapid, firm swelling of the gland, producing hard, woody thyroiditis. About half of the patients are men. In about half of the patients the process is unilateral. The gland is irregular and bound down to surrounding structures, giving rise, as a rule, to a preoperative diagnosis of carcinoma. However, there is no involvement of the skin or of the regional lymph nodes. As the disease progresses, there may develop compression of the trachea with asphyxia, hoarseness, dysphagia and involvement of the great

vessels. Tracheotomy is necessary in about one fifth of the cases. Microscopically, the gland is largely replaced with dense fibrous tissue containing an occasional lymphoid follicle and some foreign body giant cells. As much of the mass should be removed surgically as possible.

Various types of involvement of the thyroid by *Trypanosoma cruzi* have been described in South America by Chagas.

NEW GROWTHS

The best review of the subject is given by Pemberton.²⁶ The ratio of malignant to benign tumors of the thyroid at the Mayo Clinic is about 4.9 per cent. Carcinoma of the thyroid may occur at any age but is most common between the ages of 40 and 70 years. The average age for men is about 53 years and for women about 48 years. The ratio of males to females in the experience of the Mayo Clinic is about 1 to 1.74.

Carcinoma of the thyroid almost always arises from a preexisting adenoma, although in rare instances it may develop in a gland involved in exophthalmic goiter. The diagnosis is not suspected before operation in about 60 per cent of the cases.

Papillary adenocarcinoma is of a low grade of malignancy and carcinoma in adenoma is of a slightly higher grade, while diffuse adenocarcinoma represents "the acute fulminating malignant growths of the thyroid gland."

Squamous epithelioma and sarcoma are very rare and very highly malignant. It is uncertain whether they arise from extensions from the esophagus, trachea or thyroglossal duct or directly from the thyroid by metaplasia of the epithelium.

Malignant change of the thyroid is most commonly confused with Riedel's struma, struma lymphomatosa and hemorrhagic adenoma. In the early stages it can be diagnosed only on histologic examination.²⁷ As the disease progresses, "the history of recent increase in the size of a pre-existing adenoma, the recent development of a tumor of the thyroid gland, a complaint of a sense of pressure in the neck, often out of proportion to the size of the tumor and the finding on palpation of a thyroid tumor that is firmer, more nodular and relatively more firmly fixed than that usually encountered in benign goiters, are all suggestive evidence. . . . Hoarseness and a fixed vocal cord in the absence of syphilis, aortic aneurysm or mitral stenosis are almost pathognomonic of malignancy." There is uncertainty about what constitutes microscopic evidence of malignancy. Invasion of blood vessels appears to be an absolute criterion but, according to Pemberton,²⁶ is not necessary for diagnosis, anaplasia and dedifferentiation being adequate evidence, as they are for carcinoma elsewhere in the body.

Whenever feasible, the tumor should be removed, and if complete removal is impossible, the operation should be followed by roentgen ray or radium treatment. If the growth is inoperable, radiation therapy is used alone. Complete fixation to surrounding structures of the neck and the presence of distant metastases are contraindications to operation. Enlargement of cervical lymph nodes also constitutes a contraindication except in the case of the slowly growing papillary adenocarcinoma.

24. Clute, H. M.: Thyroiditis—Simple, Suppurative and Chronic, *Tr. Am. A. Study Goiter*, 1931, p. 136.

25. Joll, C. A.: The Pathology, Diagnosis and Treatment of Hashimoto's Disease (Struma Lymphomatosa), *Brit. J. Surg.* 27: 351 (Oct.) 1939.

26. Pemberton, J. deJ.: Malignant Lesions of the Thyroid Gland: A Review of Seven Hundred and Seventy-Four Cases, *Tr. Third Internat. Goiter Conf. & Am. A. Study Goiter*, 1938, p. 154.

27. Graham, Allen: Nodular Goiters: Their Relation to Neoplasia, *Am. J. Surg.* 7: 163 (Aug.) 1929.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION
OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

HANOVIA AERO-KROMAYER LAMP
MODELS S-2202, S-2203
ACCEPTABLE

Manufacturer: The Hanovia Chemical & Mfg. Company,
Newark, N. J.

The Hanovia Aero-Kromayer Lamp is described by the firm
as "A super high pressure quartz mercury vapor arc lamp of
the activated electronic self-lighting type which is recommended
for therapeutic use when local applications of ultraviolet radia-
tion are required." Model S-2202 is for use with direct current,
and model S-2203 operates on alternating current.

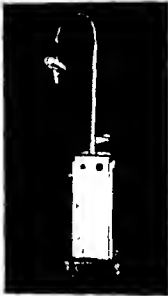


Fig. 1.—Hanovia
Aero-Kromayer Lamp.

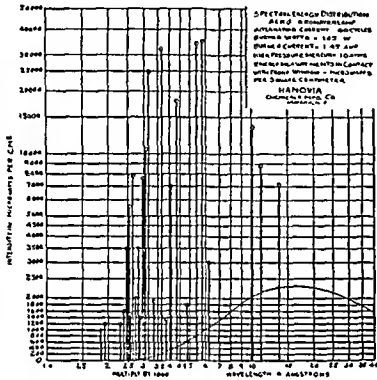


Fig. 2.—Spectral energy distribution
curv.

A fused quartz, C-shaped burner containing mercury which
vaporizes completely to a pressure of ten atmospheres during
operation, a starting gas and activated electronic type electrodes
comprise the lamp proper; the burner is completely enclosed
within a metal housing provided with a fused quartz window.
Another housing, which further encloses the burner unit, is
said by the firm to provide forced draft cooling and partial
removal of infra-red radiations and to be adapted for the han-
dling and support of applicators for the conduction of the
ultraviolet radiation into body cavities. Elimination of water
for cooling, the decrease in the mercury content of the burner
and complete vaporization of the mercury reduce weight and
facilitate handling.

The lamp is used manually. An automatically controlled red
warning light mounted on the control cabinet indicates when the

TABLE 1.—Electrical Characteristics of the Lamp

	Alternating Current	Direct Current
Supply	Model S-2203	Model S-2202
Supply voltage	115 (105-125)	115 (105-130)
Fuse size	20 amperes	10 amperes
Starting current	12 amperes	4 amperes
Operating current	5 amperes	2.5 amperes
Wattage	230 watts	340 watts
Burner		
Burner voltage	135 volts	65 volts
Starting current	4.2 amperes	4 amperes
Operating current	1.6 amperes	2.5 amperes
Wattage	160 watts	160 watts
Motor		
Wattage	25 watts	25 watts

mercury is completely evaporated and the lamp is ready for
application.

The data in table 1 as to the electrical characteristics of the
lamp were submitted by the firm.

The lamp produces the familiar mercury arc in quartz spec-
trum, but the spectral energy distribution differs from that of
the usual air cooled or water cooled lamps because of the higher
pressure of the mercury vapor in the Aero-Kromayer.

In the Council's investigation of the physical characteristics
of the lamp it was found that the relative spectral intensities
were similar to those of any hot quartz lamp, differing mainly
in having a brighter continuous background. The integrated
ultraviolet total intensity of wavelengths 3,132 angstroms and
shorter was measured with a balanced thermopile and filter.

Table 2 gives the total radiant power of wavelengths 3,132
angstroms and shorter in microwatts per square centimeter in
the center of the light beam at various distances measured from
the front window of the lamp when operated on 115 volts
alternating current.

Presumably owing to internal reflection from the aluminum
metal support, with the compression window in place the inten-
sity was found to be practically unchanged in the center of the
beam. With the compression window in place (at a distance of
1.5 cm. in front of the outer lamp window) the intensity was
about 150,000 microwatts per square centimeter, requiring about
one-third second to produce a minimum perceptible erythema.
However, since the irradiated field is spotted, this is only an
average value.

Two series of erythema tests were made on the forearm at
the compression window (but not under compression) with
exposures of one, two and three seconds. In one series of trials
the erythema resulting from the one second exposure dis-
appeared in less than twenty-four hours. In another series,
part of the irradiated field for one second's exposure continued
red for two days, apparently from unequal irradiation. The
longer exposures produced a second degree erythema with per-
ceptible pigmentation. The erythema tests therefore confirm
the radiometric measurements and calculations, showing that,
at the compression window, the ultraviolet radiation intensity
of wavelengths 3,132 angstroms and shorter is very high.

Clinical investigation of the lamp showed that the rim of the
outer window became quite hot after the lamp had been in use
a few seconds. When treating lesions requiring compression it

TABLE 2.—Total Radiant Power

Distance from front window	40 cm.	30 cm.	15 cm.	4 cm.	1.5 cm.
Intensity, microwatts per square centimeter.....	790	1,440	4,800	46,000	155,000

is necessary to use some material which does not conduct heat
at the periphery of the compression window. Some diseases
which ordinarily respond to ultraviolet rays were treated with
the Hanovia Aero-Kromayer Lamp. The results were the
same as those obtained with other sources of ultraviolet genera-
tors in which the physical characteristics correspond to those
of the lamp under investigation.

The Council on Physical Therapy voted to accept the Hanovia
Aero-Kromayer Lamp, Models S-2202 and S-2203, for inclusion
on its list of accepted devices.

Early Reference to Insanity in the Bible.—The earliest
reference to insanity in the old Bible (1451 B. C.) is probably
that in Deuteronomy 28:28, where it says, "The Lord shall
smite thee with madness, and blindness, and astonishment of
heart," a threatened punishment for those who disobey the
commands of God. Among the early Hebrew accounts are
the recurrent attacks of melancholia and mania terminating in
the suicide of Saul (1097-1058 B. C.), King of Israel, the
simulated insanity of David, and the lycanthropic mental ill-
ness of Nebuchadnezzar of Babylonia.—Lewis, Nolan D. C.:
A Short History of Psychiatric Achievement, New York,
W. W. Norton & Co., Inc., 1941.

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SATURDAY, AUGUST 9, 1941

THE NEW PHYSIOLOGIC SURGERY ON THE HEART

Until its modern period surgery was largely concerned with the removal of diseased parts of the human body. This type of surgery, while beneficial, is essentially the surgery of mutilation. No doubt legs will continue to be amputated, appendixes will be removed, parts of the brain will be ablated. Nevertheless the present trend of surgery is reconstructive, plastic, physiologic. The interesting surgery on the heart now under investigation in several institutions illustrates this exploration toward future progress.

The heart is anchored in the body by the great vessels at its base. This anatomic arrangement deprives the organ of continuity with adjacent tissues; physiology teaches that continuity is essential for the development of blood vessels from one structure to another. If continuity is given between myocardium and the parietal pericardium, mediastinal or omental fat or skeletal muscle, anastomoses will develop between the coronary arteries and the arteries of the grafted tissues. Beck and his associates¹ in Cleveland have demonstrated such anastomoses. These anastomotic channels are readily seen in specimens that were injected and cleared. The largest anastomoses measure about 1 mm. in diameter. The vessels of the grafted tissues can be injected from the coronary arteries, and the coronary arteries can be injected from the grafts, thus establishing the existence of continuity. The grafts, it is reported, do not in any way interfere with the beating of the heart.

As pointed out by Beck, a second anatomic arrangement that adds to the ravages of coronary artery disease can be found in the capillary bed of each coronary artery. The right coronary artery, the descending ramus of the left coronary artery and the circumflex ramus

of the left coronary artery possess capillary beds that practically do not anastomose one with another. If the beds were freely united, occlusive disease of any one artery could be better tolerated.

The Cleveland investigators have shown that intercoronary communications can be produced in two ways. One method, and this is not a surgical method, is by occlusion of a coronary artery. They have shown experimentally that, if a normal heart tolerates occlusion of a major coronary artery, intercoronary communications always develop and a common coronary bed is produced. While the stimulus of arterial occlusion cannot be used as a surgical method to produce intercoronary communications, it can be used effectively in an indirect manner. Consideration must be given to the two destructive factors that accompany coronary artery occlusion. One of these is death of myocardium or the formation of an infarct. The other is ventricular fibrillation, which produces heart failure and total death of the body. These destructive factors are both due to lack of oxygen. They can be prevented by a relatively small amount of oxygenated blood delivered through the occluded artery. This relatively small amount of blood need not be enough to make possible active contraction of the myocardium but just enough to preserve the viability of the heart muscle and to prevent it from changing to scar tissue. The Western Reserve investigators have shown that a sufficient quantity of blood can be delivered to the occluded artery by surgical methods to prevent death of myocardium and to prevent ventricular fibrillation. If the heart can be made to survive the critical period following occlusion, the stimulus of occlusion becomes effective. Ultimately these two destructive factors disappear as a common coronary bed comes into existence.

The second method by which a common coronary bed can be produced is by inflammation. The inflammatory agent may be mechanical or chemical. Beck used abrasion of the surface of the heart and powdered beef bone as a foreign body to produce inflammation. Recently Stanton, Schildt and Beck² made measurements of the effect of epicardial abrasion and also the effect of various chemical agents in reference to the development of intercoronary communications. They found that abrasion of the heart alone gave a definite protection to the heart. It reduced the mortality from 70 per cent in 50 normal hearts in which the descending ramus of the left coronary artery was ligated at its origin to 38 per cent in 50 hearts in which the same artery was ligated but in which the surface of the heart had been abraded at a previous operation. Abrasion opened up intercoronary communications and reduced the size of the infarct. Indeed, in some of the specimens an infarct did not develop after ligation of the descending artery.

1. Beck, C. S.: Development of a New Blood Supply to the Heart by Operation, *Ann. Surg.* 102: 801 (Nov.) 1935. Beck, C. S., and Tichy, V. L.: The Production of a Collateral Circulation to the Heart, *Am. Heart J.* 10: 849 (Oct.) 1935. Mautz, F. R., and Beck, C. S.: The Augmentation of Collateral Coronary Circulation by Operation, *J. Thoracic Surg.* 7: 113 (Dec.) 1937. Beck, C. S.: Further Data on the Establishment of a New Blood Supply to the Heart by Operation, *ibid.* 5: 604 (Aug.) 1936.

2. Stanton, E. J.; Schildt, P. J., and Beck, C. S.: Abrasion of Surface of Heart and Effect on Intercoronary Communications, *Am. Heart J.*, to be published.

An infarct always develops in a normal heart after this artery is ligated. It was shown that intercoronary communications developed as early as five to seven days after the surface of the heart was abraded. Certain chemical agents produce a profound reaction on the surface of the heart, and their use is not without danger. Calcium and magnesium silicate in fibrous form in small quantities was found to produce the most desirable reaction. A small amount of this substance placed on the surface of the heart produces a reaction which seems to aid the development of intercoronary channels. The mortality in such experiments following ligation of the descending ramus is about 20 to 30 per cent. In some of these specimens there is no infarct.

Application of some of these new physiologic facts to the surgery of coronary disease was first made by Beck, it is reported, on Feb. 13, 1935. The patient was a farmer. He became totally crippled by coronary artery disease. The patient, who considered his life intolerable, tolerated the operation, recovered and is now employed as a farm hand. This patient believes that he is cured. Thirty such patients were operated on. All were considered bad risks for any operation, and 10 were lost in the postoperative period. Of the 20 who survived, 17 continue to live and almost all consider themselves improved. The beneficial result in some of these cases has been almost incredible. The data obtained from this study group have been encouraging. Many of the patients stated that they felt better as early as one week after operation. The earliest that Beck and Tichy could demonstrate a watery dye passing from grafts to heart was two or three weeks after operation. This early improvement as stated by the patients was discounted at that time because there was no experimental evidence to support it. Now, however, this early clinical improvement can be accepted because intercoronary communications can be demonstrated within a few days after operation and these intercoronary channels can account for the early clinical improvement. Indeed, early clinical improvement is now to be expected after operation.

The results of these pioneer operations have just been published in the *Journal of Thoracic Surgery*.³ It has also been shown by the Western Reserve investigators that the heart maintains its protection over a period of months after it has been prepared by operative methods, even though arterial occlusion has not been added to the experiment. From these experiments it would appear that the operation has prophylactic value.

Coronary artery disease cannot be eradicated by operation. Every procedure must therefore be considered in terms of improvement following operation rather than cure of the disease. After muscle degenerates

into scar tissue, the infarct cannot be changed back to muscle. Some patients may not appear to be helped by the operation because the destructive process of the disease in the coronary arteries may be more rapid than the reconstructive process following the operation. These limitations must be considered but apparently should not necessarily preclude application of the operation in the treatment of coronary artery disease and angina pectoris.

Experimentally in animals it has been shown that the normal heart can tolerate the operation almost without any risk. If the disease itself is not totally incapacitating, the risk should not be much greater than that of many other operations. Even if the disease is totally incapacitating, the Cleveland surgeons say the operation can be done. The patients selected by Feil were totally incapacitated, and even in this group the mortality was not forbidding. Possibly a more limited procedure could be applied to patients who have advanced disease.

RELATION OF CHEMICAL STRUCTURE OF MORPHINE DERIVATIVES TO ADDICTION LIABILITY

Many agencies have been interested in the solution of the problem of drug addiction. The Division of Mental Hygiene of the United States Public Health Service includes among its functions (1) the administration of two federal institutions for the confinement and treatment of persons addicted to the use of habit forming drugs, (2) the conduct of studies dealing with the nature of drug addiction and (3) possible methods of treatment and rehabilitation of persons addicted to the use of habit forming drugs, and (4) the supervision and furnishing of the medical and psychiatric services in the federal prison system. The National Research Council, the Rockefeller Foundation, the U. S. Public Health Service, the U. S. Bureau of Narcotics, the University of Virginia and the University of Michigan are some of the other institutions which participate in the prosecution of the studies.

The purpose of these combined studies has been to find some means of reducing or correcting the evils of drug addiction. The assumption has been made that some persons possess receptors which, when combined with a chemical unit of an addictive drug, give rise to a sense of euphoria. Desirable therefore was separation chemically, if possible, of the addiction property of morphine from its analgetic attributes. A systematic study was made of a series of modifications of the morphine molecule, followed by a careful physiologic study and application to man of those substances which give definite indications of value.

A series of sixteen drugs, all modifications of the morphine molecule and of known chemical composition,

3. Feil, Harold, and Beck, C. S.: Coronary Sclerosis and Angina Pectoris, *J. Thoracic Surg.* 10: 529 (June) 1941.

have been studied in man. One of the chemical difficulties in this research has been to provide drugs which would prolong the pain control factor so as to reduce the need for repeated dosage and at the same time to eliminate the fraction responsible for euphoria.

Much of the clinical work in this connection is being conducted at the U. S. Public Health Service Hospital, Lexington, Ky., an institution suited for the prosecution of this type of investigation because of the complete control of its patients. The approach to the problem, according to Himmelsbach,¹ was based on the hypothesis that variations in chemical structure often cause variations in physiologic effects, and that if the latter can be identified with certain portions of the morphine molecule it might be possible to suppress or eliminate undesirable actions and at the same time retain or improve the desirable effects. The method employed consisted of selection of addicts with active physical dependence, preliminary stabilization of patients on morphine, replacement of morphine by another substance for a period of at least one week, and withdrawal of the substituted drug. In this way, according to Himmelsbach, one may learn whether or not a chemical substance will satisfy preestablished physical dependence. The maintenance of physical dependence by a substituted drug is considered to indicate that it is capable of producing addiction. No nonaddictive drug has been found to support physical dependence. The physical dependence already established to morphine apparently becomes adapted to the substitute, for, on withdrawal, detectable and self-consistent dissimilarities have been found in the abstinence syndromes of drugs studied. These dissimilarities are based on alterations in chemical structure. The abstinence syndrome which appears after withdrawal of the substituted drug is thought to be the equivalent of that which would occur were addiction to the substituted drug primary instead of secondary.

The phenanthrene derivatives of opium experimented with were dihydromorphine, alpha-isomorphine, dihydro-alpha-isomorphine, dihydromorphinone, dihydrodesoxy-morphine-D, codeine, dihydrocodeine, isocodeine, dihydroisocodeine and dihydrodesoxycodine-D.

The results obtained by Himmelsbach are qualitatively similar to those of Small and Eddy.² By means of substitution technic, data were obtained on the potency and duration of the physical dependence action

of each of ten related drugs of the morphine, codeine series. From comparisons of pairs of drugs differing from each other in only one structural respect it would appear that, as far as physical dependence action is concerned, (a) methylation of the phenolic OH reduces potency and prolongs action, (b) replacement of the alcoholic OH by H or O increases potency and shortens the action, (c) spatial shift of the alcoholic OH results in irregular effects and (d) saturation of the C-7, 8 double bond tends to increase both the potency and the duration of action. None of the types of chemical modifications mentioned in this report caused reductions in both duration and intensity of physical dependence action. It is nonetheless reasonable to expect that this research will eventually lead to the discovery of a substitute which, while retaining the analgetic attributes of morphine, would possess the minimum of its addiction property.

Current Comment

SCIENCE IN A TROUBLED WORLD

Amidst the rubble of bombings, the distinguished physiologist and member of Parliament Dr. A. V. Hill¹ addressed the House of Commons. Dr. Hill is uneasy about certain tendencies that have developed in science in his country as they have in ours. A growing tendency for political considerations to exercise an influence on science is viewed with alarm by every scientist. "In order to preserve the integrity of science in our own country," Dr. Hill states, "it is very important that those strong independent scientific bodies should be maintained: and for the sake of international scientific relations it is desirable that in other countries also, so far as we can influence them, the domination of the state over science should be tempered by public appreciation of the part played by independent scientific agencies and institutions." The British spokesman recognizes the importance, indeed the necessity, of scientific organizations within the framework of government. Anent the hazard of government subsidized research he mentioned "the danger that he who pays the piper may call the tune, and that research may be required to be devoted primarily to objects which the politician, or the civil servant, regard for the moment as of national importance." To avoid the evils of this he calls for a powerful buffer to prevent the state from interfering with the integrity and independence of research. Dr. Hill said, in conclusion, "Blessed are they who remain innocently in their laboratories and grumble: for it is a thankless task to get things right. . . . All we ask is that we should be considered as equals in a common task—not merely as superior technicians paid to dish up the magic which you order."

1. Himmelsbach, C. K.: Studies of Certain Addiction Characteristics of (a) Dihydromorphine ("Paramorphan"), (b) Dihydrodesoxymorphine-D ("Desomorphine"), (c) Dihydrodesoxycodine-D ("Desocodine") and (d) Methylhydromorphinone ("Metopon"). J. Pharmacol. & Exper. Therap. 67: 239 (Oct.) 1939; The Effects of Certain Chemical Changes on the Addiction Characteristics of Drugs of the Morphine, Codeine Series, *ibid.* 71: 42 (Jan.) 1941.

2. Small, L. F., and Eddy, N. B.: Some Relationships Between Chemical Constitution and Pharmacological Action in the Morphine Series, in Small, L. F.; Eddy, N. B.; Mosettig, E., and Himmelsbach, C. K.: Studies on Drug Addiction with Special Reference to Chemical Structure of Opium Derivatives and Allied Synthetic Substances and Their Physiological Action, Pub. Health Rep., 1938, supp. 138.

1. Hill, A. V.: Science, National and International, and the E. of Cooperation, Science 93: 579 (June 20) 1941.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY WAR DEPARTMENT

The following additional medical reserve corps officers have been ordered to extended active duty by the War Department, Washington, D. C.:

ADAMS, John E., 1st Lieut., Los Angeles.
ALDES, John H., 1st Lieut., Cincinnati.
ANDERSON, Andrew Russell, 1st Lieut., Baltimore.
APRILE, Ignatius Joseph, 1st Lieut., Jackson Heights, L. I., N. Y.
BAKER, William Nowers, 1st Lieut., Pueblo, Colo.
BERK, Jack Edward, 1st Lieut., Philadelphia.
BERK, Morris David, Captain, Pompton Lakes, N. J.
BERMAN, Reuben, Captain, Minneapolis.
BETHEA, John Hardee, Captain, New Orleans.
BOEDEKER, Roy Vincent, Captain, Russellville, Ky.
BURNS, Harry, Captain, Fort Des Moines, Iowa.
BYRNE, Walter Robbins, 1st Lieut., Russellville, Ky.
CARBONEL, Arthur Joseph, 1st Lieut., Washington, D. C.
CICCONE, Roy, Captain, Boston.
CRUTCHER, John Sims, Jr., Major, Athens, Ala.
DEEMS, Myers Bowman, 1st Lieut., St. Louis.
DESSSEN, Edgar Lee, 1st Lieut., Philadelphia.
EAGLES, Archie Y., 1st Lieut., Baltimore.
EVANS, William Dustin, 1st Lieut., Los Angeles.
FARRIOR, James Harvey, 1st Lieut., Montgomery, Ala.
FRENCH, Lyle Albert, 1st Lieut., Minneapolis.
FISHER, Rowan Elliott, 1st Lieut., Dallas, Texas.
FOSTER, Rae N., 1st Lieut., John Day, Ore.
GAMBLE, Jess Franklin, 1st Lieut., Alexandria, Va.
GODARD, Clarence Harley, 1st Lieut., Los Angeles.
GRAHAM, John Glenwood, Jr., 1st Lieut., University City, Mo.
HAINESWORTH, Winston Clarkson, 1st Lieut., Washington, D. C.
HARRIS, Major Haymond, 1st Lieut., Decatur, Ga.
HOFFMAN, I. Louis, Captain, Brooklyn.
HOURICAN, Donald Joseph, 1st Lieut., Pittsburgh.
HUGHES, Jack Robert, 1st Lieut., San Francisco.
JESSER, Joseph-Herman, 1st Lieut., Chicago.
JESURUN, Harold Mendez, 1st Lieut., Brooklyn.
JOHNSON, Elgie Karl, 1st Lieut., Columbus, Ohio.

JONES, Harry Douglas, 1st Lieut., Nashville, Tenn.
KAMINSKI, Paul Joseph, 1st Lieut., Baltimore.
KANTOR, George J., Captain, Brooklyn.
KENNEDY, Paul Andrew, 1st Lieut., Scranton, Pa.
KERRON, Seth Metcalfe, Major, Vancouver, Wash.
LATIMER, John Wilmer, Jr., 1st Lieut., Washington, D. C.
LEONARD, William Parker, Jr., 1st Lieut., Talbotton, Ga.
LIHN, Barney, 1st Lieut., Vineland, N. J.
MALONEY, John Joseph, 1st Lieut., Washington, D. C.
MARKLE, Philip Metric, Captain, Memphis, Tenn.
NASH, Joseph, 1st Lieut., New York.
NEWMAN, Robert Lewis, 1st Lieut., Kansas City, Kan.
NOLAN, Oscar Frederick, Captain, San Francisco.
O'CONNELL, John Richards, 1st Lieut., Fort Dodge, Iowa.
PRATT, Thomas Dennie, 1st Lieut., Brookline, Mass.
RAPEE, Lawrence Albert, 1st Lieut., Washington, D. C.
RIESENMAN, Francis Regis, 1st Lieut., Franklin, Pa.
ROBERTS, Harold Kersey, 1st Lieut., St. Louis.
RODDA, John S., 1st Lieut., Oakland, Calif.
ROSENFELD, Richard E., 1st Lieut., Pittsburgh.
ROSS, Donald, 1st Lieut., Chicago.
ROULHAC, George Erwin, 1st Lieut., St. Louis.
RUDI, Herbert John, Captain, St. Louis.
SACK, Samuel Senior, Captain, Brooklyn.
SAWYER, Logan Everett, 1st Lieut., Baltimore.
SHIFFLER, Harry Kirby, 1st Lieut., Des Moines, Iowa.
SILVERSTONE, Eugene Henry, 1st Lieut., Iowa City.
SIMMONS, Melvin Morris, 1st Lieut., Nashville, Tenn.
SMITH, Robert Cathcart, 1st Lieut., Baltimore.
STEVENS, Lawrence Heffron, Captain, St. Louis.
THORNE, Lewis, 1st Lieut., New Haven, Conn.
TILLMAN, Paul Frederick, Captain, Northport, L. I., N. Y.
WILKINSON, Thomas Charles, Captain, Pittsburgh.
WOLPAW, Ralph, 1st Lieut., Cleveland.
YURICK, Edward Andrew, Captain, Cleveland.

Orders Revoked

EVANS, William Dustin, 1st Lieut., Los Angeles.
JACOBSON, Alan, 1st Lieut., Baltimore.

SECOND CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Second Corps Area, which comprises the states of New York, New Jersey and Delaware:

ABERS, Bernard D., 1st Lieut., Jersey City, N. J., Advanced Flying School, Selma, Ala.
ABRAHAM, Albert E., 1st Lieut., Arlington, N. J., Air Base, Tallahassee, Fla.
ABRAHAM, Joseph, 1st Lieut., Brooklyn, Fort Jackson, S. C.
ALVAREZ, Lawrence J., 1st Lieut., Brooklyn, Camp Upton, N. Y.
AMAR, Vincent F., 1st Lieut., Yonkers, N. Y., Advanced Flying School, Albany, Ga.
AMATO, Romeo J., 1st Lieut., Newark, N. J., Air Base, Jackson, Miss.
BAKER, Augustus L., Jr., 1st Lieut., Montclair, N. J., Camp Shelby, Miss.
BALDWIN, John F., 1st Lieut., West Englewood, N. J., Fort Dix, N. J.
BANTA, Raymond E., 1st Lieut., Tenafly, N. J., Fort Jay, N. Y.
BARMEYER, George H., Jr., 1st Lieut., Bayside, N. Y., Air Base, Savannah, Ga.
BARRETT, George S., 1st Lieut., Scotia, N. Y., Carlisle Barracks, Pa.
BASHEIN, Hyman, Captain, Brooklyn, Advanced Flying School, Selma, Ala.
BEACHER, Milton D., 1st Lieut., Brooklyn, Air Base, Augusta, Ga.
BEAVERS, Alonzo J., Jr., 1st Lieut., Valhalla, N. Y., Air Base, Savannah, Ga.
BENNY, John M., 1st Lieut., Buffalo, Fort Niagara, N. Y.
BERLIN, Walter, 1st Lieut., Jersey City, N. J., Camp Shelby, Miss.
BLACK, Asher, 1st Lieut., Solvay, N. Y., Fort Ontario, N. Y.
BOBBETT, Gordon H., 1st Lieut., Auburn, N. Y., Fort Ontario, N. Y.
BOORSTEIN, Maccabee, 1st Lieut., New York, Fort Jackson, S. C.
BOYD, Hamilton, Jr., 1st Lieut., Kingston, N. Y., Elgin Field, Valparaiso, Fla.
BRANDES, Peter, 1st Lieut., Malone, N. Y., Plattsburg Barracks, N. Y.
BREIN, Victor M., 1st Lieut., Buffalo, Fort Niagara, N. Y.
BROADMAN, Sylvan A., 1st Lieut., New York, Fort Hancock, N. J.
BROWN, Kenneth L., 1st Lieut., Buffalo, Fort Niagara, N. Y.
BURSON, Leonard C., 1st Lieut., Rockaway Park, N. Y., Fort Jackson, N. Y.
CALABRESE, Dino D., 1st Lieut., Ridgefield, N. J., Camp Shelby, Miss.
CAMPBELL, Donald, 1st Lieut., New York, Fort Jackson, S. C.
CARLOZZI, Michael, 1st Lieut., Brooklyn, Camp Shelby, Miss.
CAYAVES, Paul G., 1st Lieut., New York, Camp Shelby, Miss.
CEBULA, Jerome M., 1st Lieut., Brooklyn, Advanced Flying School, Selma, Ala.
CHILDS, Milford N., 1st Lieut., Buffalo, Fort Niagara, N. Y.
CLEMENTS, James J., 1st Lieut., Syracuse, N. Y., Fort Ontario, N. Y.
COLE, Charles H., 1st Lieut., Ossining, N. Y., Camp Shelby, Miss.
COOPER, George M., 1st Lieut., Buffalo, Fort Niagara, N. Y.
CORLESS, Joseph F., 1st Lieut., West New York, N. J., Air Base, Orlando, Fla.
COSGROVE, Robert A., Captain, Jersey City, N. J., Fort Du Pont, Del.
CROZIER, Dan, 1st Lieut., Brooklyn, Fort Hancock, N. J.
CUTLER, Martin, 1st Lieut., Brooklyn, Air Base, Baton Rouge, La.
DANIEL, Walter A., 1st Lieut., Brooklyn Headquarters 2d Military Area, New York.
DANZIS, Louis, 1st Lieut., Irvington, N. J., Camp Shelby, Miss.
DAVIS, Isidore, 1st Lieut., Brooklyn, Advanced Flying School, Albany, Ga.
DEHOFF, John B., 1st Lieut., New York, N. Y., Air Base, West Palm Beach, Fla.
DELAGI, Edward F., 1st Lieut., New York, Fort Jackson, S. C.
DEMARCO, Luciano E., 1st Lieut., Newark, N. J., Camp Shelby, Miss.
DENGROVE, Edward, 1st Lieut., Jersey City, N. J., Air Base, West Palm Beach, Fla.
DOLGOW, Joseph, 1st Lieut., Brooklyn, Air Base, Augusta, Ga.
DORF, Victor, 1st Lieut., Brooklyn, Camp Shelby, Miss.
DREXLER, Milton, 1st Lieut., New York, Camp Shelby, Miss.
EDELMAN, Robert M., 1st Lieut., Richmond Hill, L. I., 38th Division, Camp Shelby, Miss.
ENGELHARD, George E., 1st Lieut., Arlington, N. J., Pine Camp, N. Y.
ERBER, Leonard B., 1st Lieut., Atlantic City, N. J., Camp Shelby, Miss.
FABIAN, Norman, 1st Lieut., Poughkeepsie, N. Y., Air Base, Savannah, Ga.

FINKLESTEIN, Howard E., 1st Lieut., Woodhaven, N. Y., Camp Claiborne, La.
 FISHBERG, Archibald, 1st Lieut., New York, Camp Shelby, Miss.
 FORD, John H., Jr., 1st Lieut., Syracuse, N. Y., Carlisle Barracks, Pa.
 FORST, Arthur, 1st Lieut., New York, Camp Shelby, Miss.
 FOX, Lester, 1st Lieut., Brooklyn, Fort Bragg, N. C.
 FUCHS, Isidor Irving, 1st Lieut., Brooklyn, Fort Hancock, N. J.
 FULLER, Robert M., 1st Lieut., New York, Pine Camp, N. Y.
 GERBER, Howard R., 1st Lieut., Brooklyn, Advanced Flying School, Albany, Ga.
 GERHARDT, Paul E., 1st Lieut., Irvington, N. J., Fort Jackson, S. C.
 GOLBY, Saul, 1st Lieut., Brooklyn, Air Base, Augusta, Ga.
 GORDON, Irving Jacob, 1st Lieut., Flushing, N. Y., Camp Stewart, Ga.
 GOTTLIEB, Morris, 1st Lieut., Ventnor City, N. J., Air Base, Orlando, Fla.
 GRABER, Irving, 1st Lieut., Brooklyn, Air Base, West Palm Beach, Fla.
 GREASER, George L., 1st Lieut., Johnson City, N. Y., Fort Niagara, N. Y.
 GREIFINGER, William, 1st Lieut., Newark, N. J., Fort Hamilton, N. Y.
 GRUBIN, Charles J., 1st Lieut., Brooklyn, Camp Blanding, Fla.
 HEAD, Joseph A., 1st Lieut., Syracuse, N. Y., Pine Camp, N. Y.
 HERMAN, Seymour J., 1st Lieut., Brooklyn, Camp Stewart, Ga.
 HICKS, Andrew R., 1st Lieut., Mount Vernon, N. Y., Advanced Flying School, Albany, Ga.
 HOCHMAN, David, 1st Lieut., Brooklyn, Air Base, Savannah, Ga.
 HOFFMAN, Benjamin, 1st Lieut., Brooklyn, Camp Stewart, Ga.
 HOROWITZ, Leo, 1st Lieut., Jersey City, N. J., Camp Shelby, Miss.
 HUBBARD, Robert D., 1st Lieut., Camden, N. Y., Madison Barracks, N. Y.
 HUMMEL, Frederick W., 1st Lieut., West Belmar, N. J., Camp Shelby, Miss.
 INGRISANO, Louis A., 1st Lieut., Brooklyn, 114th Infantry, Fort Dix, N. J.
 JAFFE, Bernard, 1st Lieut., New York, Advanced Flying School, Selma, Ala.
 JANNARONE, Lewis H., 1st Lieut., Belleville, N. J., Fort Jackson, S. C.
 JESURUN, Harold M., 1st Lieut., Brooklyn, Fort Bragg, N. C.
 JONES, Courtland S., 1st Lieut., Buffalo, Fort Niagara, N. Y.
 JONES, William F., 1st Lieut., Somerville, N. J., Air Base, Orlando, Fla.
 JUVETIER, Bernard W., 1st Lieut., Buffalo, Fort Niagara, N. Y.
 KAINE, Henry, 1st Lieut., New York, Fort Jackson, S. C.
 KARP, Frank L., 1st Lieut., Long Beach, L. I., Fort Bragg, N. C.
 KAYCOFF, Aaron J., 1st Lieut., Elizabeth, N. J., Air Base, Meridian, Miss.
 KELLER, Paul D., 1st Lieut., Brooklyn, Camp Shelby, Miss.
 KENT, Louis R., 1st Lieut., Fort Washington, N. Y., Camp Shelby, Miss.
 KLEMAN, Gilbert L., 1st Lieut., New Rochelle, N. Y., Air Base, Augusta, Ga.
 KLIMASZEWSKI, Lucyan F., 1st Lieut., Syracuse, N. Y., Fort Dix, N. J.
 KOCH, William J., 1st Lieut., Interlaken, N. J., Carlisle Barracks, Pa.
 KRISCHER, Meyer I., 1st Lieut., Brooklyn, Fort Jackson, S. C.
 KURLAND, Harry A., 1st Lieut., New York, Fort Jackson, S. C.
 LAMBERTI, John J., 1st Lieut., Yonkers, N. Y., Air Base, Augusta, Ga.
 LARKEY, Irving G., 1st Lieut., Newark, N. J., Fort Benning, Ga.
 LEVIN, Paul R., 1st Lieut., Whitney Point, N. Y., Fort Niagara, N. Y.
 LEAK, Glenn H., 1st Lieut., Buffalo, Fort Niagara, N. Y.
 LENOBEL, Milton I., 1st Lieut., Brooklyn, Air Base, Augusta, Ga.
 LETTERESE, Thomas G., 1st Lieut., New York, Fort Jackson, S. C.
 LEIBENHAUT, Milton, 1st Lieut., Brooklyn, 38th Division, Camp Shelby, Miss.
 LEVINE, Sanford, 1st Lieut., Brooklyn, Advanced Flying School, Selma, Ala.
 LICKERMAN, Nathan, 1st Lieut., New York, Air Base, Jackson, Miss.
 LIPARI, Michael, 1st Lieut., Hicksville, N. Y., Advanced Flying School, Albany, Ga.
 LONDON, Ephraim J., 1st Lieut., Brooklyn, Fort Benning, Ga.
 LOVELOCK, Francis J., 1st Lieut., New York, Fort Wadsworth, N. Y.
 LYNCH, Thomas F., 1st Lieut., New York, Camp Upton, N. Y.
 McDERMOTT, Kenneth J., 1st Lieut., Syracuse, N. Y., Fort Ontario, N. Y.
 McVAUGH, Charles C., 1st Lieut., New York, Air Base, Tallahassee, Miss.
 MARKS, Jerome L., 1st Lieut., New York, Fort Wadsworth, N. Y.
 MAYBARDUK, Alexander P., 1st Lieut., New York, Camp Shelby, Miss.
 MAYER, Victor, 1st Lieut., Brooklyn, Camp Blanding, Fla.
 MELAVILLE, Eugene F., 1st Lieut., Rochester, N. Y., Fort Niagara, N. Y.
 MEYER, Albert H., 1st Lieut., Brooklyn, Flying Cadet Examining Board, New York.
 MERMELL, Lester, 1st Lieut., Middletown, N. Y., Induction Station, Fort Jay, N. Y.
 MONACO, Saverio A., 1st Lieut., Newark, N. J., Fort Dix, N. J.
 MORTON, Edward A., 1st Lieut., New York, Fort Jackson, S. C.
 MUNRO, Howard F., Captain, Freeport, N. Y., Fort Jackson, S. C.
 MURPHY, Arthur G., 1st Lieut., Montclair, N. J., Fort Monmouth, N. J.
 MURPHY, George E., 1st Lieut., Paterson, N. J., Carlisle Barracks, Pa.
 NEWELL, Robert B., 1st Lieut., Rockmore, N. Y., Fort Niagara, N. Y.
 NEWMAN, Ernest B., 1st Lieut., Brooklyn, Camp Blanding, Fla.
 NEIER, Charles R., 1st Lieut., Jamaica, N. Y., Camp Lee, Va.
 NONAS, Gerson, 1st Lieut., Brooklyn, 8th Division, Fort Jackson, S. C.

NUSSBAUM, Herman, 1st Lieut., Welfare Island, N. Y., Elgin Field, Valparaiso, Fla.
 OAKES, Aiden B., 1st Lieut., Brooklyn, Air Base, Augusta, Ga.
 O'CONNOR, Daniel J., 1st Lieut., Brooklyn, Air Base, Orlando, Fla.
 PEIMER, Ralph, 1st Lieut., Paterson, N. J., Fort Dix, N. J.
 PENNINGTON, Glenn W., 1st Lieut., New York, Camp Blanding, Fla.
 PERSICO, Anthony J., 1st Lieut., New York, Advanced Flying School, Albany, Ga.
 PETINGA, Thomas J., 1st Lieut., Atlantic City, N. J., Fort Du Pont, Del.
 PLATT, Edward V., 1st Lieut., Haddon Heights, N. J., Camp Shelby, Miss.
 RAUH, Albert E., 1st Lieut., New York, Induction Station, Fort Jay, N. Y.
 REINUS, Francis Z., 1st Lieut., New York, Air Base, Augusta, Ga.
 RITOTA, Michael C., 1st Lieut., Orange, N. J., Camp Shelby, Miss.
 ROBBINS, Howard C., 1st Lieut., Bridgeton, N. J., Air Base, Savannah, Ga.
 ROBERTS, Montague A., 1st Lieut., Englewood, N. J., Fort Hancock, N. J.
 ROEMMELT, John C., Jr., 1st Lieut., Horseheads, N. Y., Carlisle Barracks, Pa.
 ROGERS, Samuel L., 1st Lieut., Brooklyn, Air Base, Tallahassee, Fla.
 ROOT, Nathan N., 1st Lieut., Kew Gardens, N. Y., Induction Station, Fort Jay, N. Y.
 ROSEN, Bernard A., 1st Lieut., New York, Air Base, Meridian, Miss.
 ROTHSTEIN, Daniel, 1st Lieut., Welfare Island, N. Y., Elgin Field, Valparaiso, Fla.
 RUBENSTEIN, George, 1st Lieut., Dunkirk, N. Y., Fort Niagara, N. Y.
 RUDOY, Martin, 1st Lieut., Brooklyn, 38th Division, Camp Shelby, Miss.
 RUMORE, Emanuel V., 1st Lieut., Brooklyn, Air Base, Meridian, Miss.
 RUSTIN, Howard F., 1st Lieut., Brooklyn, Advanced Flying School, Selma, Ala.
 RYAN, David F., 1st Lieut., Yonkers, N. Y., Camp Shelby, Miss.
 RYTERBAND, Louis, 1st Lieut., Brooklyn, Air Base, Jackson, Miss.
 SALMERI, Edward J., 1st Lieut., Woodridge, N. J., Fort McClellan, Ala.
 SALTZ, Herman P., 1st Lieut., Jersey City, N. J., Fort Jay, N. Y.
 SANDFORD, Francis R., Jr., 1st Lieut., Arlington, N. J., Fort Bragg, N. C.
 SARADARIAN, Albert V., 1st Lieut., Union City, N. J., Fort Jay, N. Y.
 SCALISE, Salvatore, 1st Lieut., Brooklyn, Camp Lee, Va.
 SCHULTZ, Elak, 1st Lieut., New York, Air Base, Savannah, Ga.
 SCHAUS, James P., 1st Lieut., Buffalo, Fort Niagara, N. Y.
 SCURTI, Bernard V., 1st Lieut., Canisteo, N. Y., Camp Shelby, Miss.
 SEGAL, Lester, 1st Lieut., New York, Camp Shelby, Miss.
 SENNE, Hubert S., 1st Lieut., Glendale, N. Y., Advanced Flying School, Albany, Ga.
 SHAPIRO, Edward E., 1st Lieut., Bayonne, N. J., Camp Shelby, Miss.
 SHAROFF, Robert L., 1st Lieut., Brooklyn, 134th Medical Regiment, Fort Bragg, N. C.
 SHEFT, Matthew J., 1st Lieut., Passaic, N. J., Plattsburg Barracks, N. Y.
 SOEHNER, Bernard P., 1st Lieut., Rochester, N. Y., Fort Niagara, N. Y.
 SORNBERGER, Charles F., 1st Lieut., Cortland, N. Y., Fort Ontario, N. Y.
 SPAETH, Frank, 1st Lieut., Syracuse, N. Y., Pine Camp, N. Y.
 STAAB, Frederick D., 1st Lieut., Rochester, N. Y., Fort Niagara, N. Y.
 STAUB, Philip L., 1st Lieut., Brooklyn, Camp Stewart, Ga.
 STEIN, Lester M., 1st Lieut., Brooklyn, Induction Station, Trenton, N. J.
 STRAUSS, Samuel D., 1st Lieut., Albany, N. Y., Elgin Field, Valparaiso, Fla.
 TERR, Isaac, 1st Lieut., Woodmere, L. I., Camp Claiborne, La.
 TRAVIS, Leroy O., 1st Lieut., Great Neck, L. I., Fort Jackson, S. C.
 UNGER, Paul N., 1st Lieut., Brooklyn, Air Base, Jackson, Miss.
 URBANOWICZ, Stanley T., 1st Lieut., Buffalo, Fort Niagara, N. Y.
 VAN BUREN, John J., 1st Lieut., Brooklyn, Air Base, Baton Rouge, La.
 VAN HOF, Joe M., 1st Lieut., New York, Fort Hancock, N. J.
 VOGEL, Nathan F., 1st Lieut., East Orange, N. J., Air Base, Tallahassee, Fla.
 VOURNAS, Christopher G., 1st Lieut., Brooklyn, Fort Du Pont, Del.
 WADRO, Harold S., 1st Lieut., New York, Air Base, Meridian, Miss.
 WAY, Clarence W., Major, Sea Isle City, N. J., Fort Dix, N. J.
 WEINSTEIN, George J., 1st Lieut., Brooklyn, Air Base, West Palm Beach, Fla.
 WEISMAN, Edward, 1st Lieut., Brooklyn, Camp Shelby, Miss.
 WEST, Theodore S., Major, Fort Chester, N. Y., General Dispensary, New York.
 WEXEBLATT, Robert, 1st Lieut., Brooklyn, Air Base, Meridian, Miss.
 WEYNERT, Joseph B., 1st Lieut., Brooklyn, Fort Bragg, N. C.
 WHITBECK, Carl B., 1st Lieut., Hudson, N. Y., Fort Dix, N. J.
 WIGH, Russell, 1st Lieut., Jersey City, N. J., Fort Dix, N. J.
 WISHIK, Julian L., 1st Lieut., Flushing, N. Y., Advanced Flying School, Selma, Ala.
 WOLFSIE, Jack H., 1st Lieut., New York, Air Base, Augusta, Ga.
 WOODIN, William G., 1st Lieut., Dunkirk, N. Y., Pine Camp, N. Y.
 YAELOW, Charles S., 1st Lieut., Mount Vernon, N. Y., Flying Cadet Examining Board, New York.
 ZATZKIN, Herbert R., 1st Lieut., New Brunswick, N. J., Air Base, Orlando, Fla.
 ZOLL, John G., 1st Lieut., Buffalo, Fort Niagara, N. Y.

Orders Revoked

ANGELO, Martin A., 1st Lieut., Buffalo.
 BABBIT, Hugh M., Jr., 1st Lieut., Plainfield, N. J.
 BAKER, Augustus L., 1st Lieut., Camp Shelby, Miss.
 BERGSTEIN, Joseph, Captain, Brooklyn.

BOLKER, Abraham, 1st Lieut., Brooklyn.
 BUMP, Samuel C., 1st Lieut., Ridgewood, N. J.
 CALABRESE, Dino D., 1st Lieut., Camp Shelby, Miss.
 DeHOFF, John B., 1st Lieut., Air Base, West Palm Beach, Fla.

DEIBERT, Kirk R., 1st Lieut., Woodlynne, N. J.
DOMANO, Patrick J., 1st Lieut., Orange, N. J.
DURHAM, James R., Jr., 1st Lieut., Wilmington, Del.
FEIGIN, Emanuel V. D., Captain, Lincoln, Neb.
GLENN, James A., Jr., 1st Lieut., North Creek, N. Y.
HOWLAND, Reeve S., 1st Lieut., Elmira, N. Y.
HYMAN, Aaron, 1st Lieut., New York.
JANNARONE, Lewis H., 1st Lieut., Fort Jackson, S. C.
JESURUN, Harold M., 1st Lieut., Fort Bragg, N. C.
KORKOSZ, August B., 1st Lieut., Schenectady, N. Y.
LaBARBERA, Thomas, 1st Lieut., Brooklyn.
LAMBERTI, John J., 1st Lieut., Air Base, Augusta, Ga.
LEADLEY, Jerome H., 1st Lieut., Rochester, N. Y.

SIXTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Sixth Corps Area, which comprises the states of Wisconsin, Illinois and Michigan:

BABBITZ, Sidney G., 1st Lieut., Milwaukee, 33d Division, Camp Forrest, Tenn.
BALUSS, John William, Jr., 1st Lieut., Ann Arbor, Mich., Selfridge Field, Mount Clemens, Mich.
BARRON, Elmer A., 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.
BARTHOLIC, Francis W., 1st Lieut., Grass Lake, Mich., 33d Division, Camp Forrest, Tenn.
BECK, Karl H., 1st Lieut., Detroit, 33d Division, Camp Forrest, Tenn.
BEHNKE, Charles H., 1st Lieut., Wauwatosa, Wis., U. S. Army Induction Station, Kalamazoo, Mich.
BERG, George S., 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
BLEIER, Robert S., 1st Lieut., Chicago, 11th Station Hospital, Fort Custer, Mich.
CALOSIO, Richard T., 1st Lieut., Joliet, Ill., 27th Division, Fort McClellan, Ala.
CIGANY, Zoltan B., 1st Lieut., Waltz, Mich., 135th Medical Regiment, Camp Shelby, Miss.
CHOY, James K. L., 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.
COHN, Isadore H., 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
CORTOPASSI, Vital E., 1st Lieut., Saginaw, Mich., 33d Division, Camp Forrest, Tenn.
CRANE, Wesley T., 1st Lieut., Northbrook, Ill., 40th Corps Area Brigade (AA), Fort Sheridan, Ill.
DICKMAN, Harry M., 1st Lieut., Detroit, 33d Division, Camp Forrest, Tenn.
ENGELMANN, Andrew T., 1st Lieut., LaCrosse, Wis., 3d Armored Division, Camp Polk, La.
FORKOSH, Sydney R., Captain, Chicago, 30th Division, Fort Jackson, S. C.
FINCH, Sinclair F., 1st Lieut., Armada, Mich., 33d Division, Camp Forrest, Tenn.
FREEMAN, Gustave, 1st Lieut., Chicago, 4th Armored Division, Pine Camp, N. Y.
FRISCH, Robert A., 1st Lieut., Milwaukee, U. S. Army Induction Station, Milwaukee.
GANTZ, Hyman A., 1st Lieut., Waukesha, Wis., 33d Division, Camp Forrest, Tenn.
GENETTI, Emil J., 1st Lieut., Bessemer, Mich., 33d Division, Camp Forrest, Tenn.
GINSBERG, Julius E., 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.
GOLDSTEIN, Hyman H., 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.
GORDON, Louis S., 1st Lieut., Peoria, Ill., 4th Armored Division, Pine Camp, N. Y.
GREENE, Bernard L., 1st Lieut., Elgin, Ill., 33d Division, Camp Forrest, Tenn.
GROSSMAN, William L., 1st Lieut., Manteno, Ill., 27th Division, Fort McClellan, Ala.
HEBENSTREIT, Kenneth J., 1st Lieut., Chicago, 4th Armored Division, Pine Camp, N. Y.
HENSKE, William C., Captain, Chippewa Falls, Wis., 29th Division, Fort Meade, Md.
HILKER, Albert W., 1st Lieut., Chicago, 191st Tank Battalion, General Headquarters, Reserve National Guard, Fort Meade, Md.
HILL, Edward L., 1st Lieut., Jacksonville, Ill., 135th Medical Regiment, Camp Shelby, Miss.
HOFFMAN, John M., 1st Lieut., Chicago, 29th Division, Fort Meade, Md.
HUFFMAN, Carroll W., 1st Lieut., Chicago, U. S. Army Induction Station, Detroit.
JANA, Joseph T., 1st Lieut., Berwyn, Ill., 29th Division, Fort Meade, Md.
JANSON, Carl H., 1st Lieut., Homewood, Ill., 33d Division, Camp Forrest, Tenn.
JUSTEN, Ralph T., 1st Lieut., Milwaukee, 33d Division, Camp Forrest, Tenn.
KAHN, Jack L., 1st Lieut., Chicago, 3d Armored Division, Camp Polk, La.
KAPUSTIAK, Wendell A., 1st Lieut., Chicago, 4th Armored Division, Pine Camp, N. Y.
KAREN, Robert, 1st Lieut., Milwaukee, 33d Division, Camp Forrest, Tenn.

LEAMAN, Granville M., 1st Lieut., East Orange, N. J.
LOVELOCK, Francis J., 1st Lieut., Fort Wadsworth, N. Y.
METCALF, Frederic U., 1st Lieut., Rockville Centre, N. Y.
NEWMAN, Ernest B., 1st Lieut., Camp Blanding, Fla.
O'TOOLE, John S., Jr., 1st Lieut., Potsdam, N. Y.
PATTI, Samuel R., 1st Lieut., Dunkirk, N. Y.
ROWE, Kenneth T., 1st Lieut., Dansville, N. Y.
SCHMIDT, Christian W., 1st Lieut., Burdett, N. Y.
SMITH, Harry G., 1st Lieut., New York.
THALER, Joseph I., 1st Lieut., Rochester, N. Y.
TIRRELL, Chester M., 1st Lieut., Newark, N. J.
VOGEL, Nathan F., 1st Lieut., Air Base, Tallahassee, Fla.
WINTER, Carl M., 1st Lieut., Camden, N. J.

KAUPPINEN, Jalo A., 1st Lieut., Grand Rapids, Mich., 33d Division, Camp Forrest, Tenn.
KIEGER, Samuel, 1st Lieut., Augusta, Mont., 33d Division, Camp Forrest, Tenn.
KOZA, John L., 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
KUHLMANN, Raymond F., 1st Lieut., Milwaukee, 135th Medical Regiment, Camp Shelby, Miss.
LASH, Sidney R., 1st Lieut., Chicago, 1604th Corps Area Service Unit, Medical Section, Fort Brady, Mich.
LENTINI, Joseph R., 1st Lieut., Grand Rapids, Mich., 3d Armored Battalion, Camp Polk, La.
LEVAGOOD, Floyd B., 1st Lieut., Detroit, 59th Signal Battalion; Fort Knox, Ky.
LEVY, Joseph, 1st Lieut., Battle Creek, Mich., 191st Tank Battalion, General Headquarters, Reserve National Guard, Fort Meade, Md.
MALEC, John P., 1st Lieut., Madison, Wis., 33d Division, Camp Forrest, Tenn.
MALOOF, George J., 1st Lieut., Madison, Wis., 135th Medical Regiment, Camp Shelby, Miss.
MALSBUURY, Charles W., 1st Lieut., Virden, Ill., 135th Medical Regiment, Camp Shelby, Miss.
MAXWELL, James H., Jr., 1st Lieut., Detroit, Station Complement, Selfridge Field, Mich.
MAYKA, John P., 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
MOORE, Eugene F., Captain, Collinsville, Ill., 29th Division, Fort Meade, Md.
MOSIMAN, William D., 1st Lieut., Morton, Ill., 3d Armored Division, Camp Polk, La.
NEEB, Walter G., 1st Lieut., Detroit, 135th Medical Regiment, Camp Shelby, Miss.
NEFCHES, Michael Stanley, Captain, Red Oak, Iowa, 135th Medical Regiment, Camp Shelby, Miss.
OLMSTED, Kenneth L., 1st Lieut., Coldwater, 33d Division, Camp Forrest, Tenn.
PASTRON, Seymour S., 1st Lieut., Chicago, 3d Armored Division, Camp Polk, La.
PERLMUTTER, Harold M., 1st Lieut., Chicago, 2d Armored Division, Fort Benning, Ga.
PFEFFER, Isadore S., 1st Lieut., Eloise, Mich., 33d Division, Camp Forrest, Tenn.
PERSSON, Leo B., 1st Lieut., Milwaukee, 135th Medical Regiment, Camp Shelby, Miss.
PORKITT, Ross J., 1st Lieut., Pontiac, Mich., 33d Division, Camp Forrest, Tenn.
PORTS, Preston W., Captain, Farmington, Mich., Station Complement, Selfridge Field, Mich.
REANEY, Burnell V., 1st Lieut., Chicago, 5th Station Hospital, Fort Stewart, Ga.
RETTIG, Frank E., Captain, Wauwatosa, Wis., 29th Division, Fort Meade, Md.
ROGERS, Albert F., 1st Lieut., Milwaukee, 33d Division, Camp Forrest, Tenn.
ROSEN, Benjamin B., 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
ROYCE, Grant E., 1st Lieut., Harvard, Ill., U. S. Army Induction Station, Milwaukee.
RUSKIN, Dave B., 1st Lieut., Wahjamega, Mich., 3d Armored Division, Camp Polk, La.
SALZMAN, Jay Marvin, Captain, Springfield, Ill., 29th Division, Fort Meade, Md.
SCHIFF, Isadore J., 1st Lieut., Chicago, Air Base, Albuquerque, N. M.
SCHWEITZER, Edmund H., 1st Lieut., Peoria, Ill., 33d Division, Camp Forrest, Tenn.
SHEMANSKI, Leonard S., 1st Lieut., Menasha, Wis., 29th Division, Fort Meade, Md.
SIEGEL, Morris, 1st Lieut., Chicago, 4th Armored Division, Pine Camp, N. Y.
SIMONS, Morton, 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.
SLAYBAUGH, James C., Captain, Wood, Wis., Armored Force Troop Unit, Fort Benning, Ga.
SMITH, Eldon E., 1st Lieut., Wausau, Wis., 135th Medical Regiment, Camp Shelby, Miss.
SMITH, Fred Robert, 1st Lieut., Detroit, 3d Armored Division, Camp Polk, La.
SMITH, Carleton R., 1st Lieut., Villa Grove, Ill., Station Complement, Camp Croft, S. C.
STEPHEN, Robert J., 1st Lieut., Joliet, Ill., 33d Division, Camp Forrest, Tenn.
STONE, Ethon L., 1st Lieut., Detroit, 3d Armored Division, Camp Polk, La.
TENKIN, Mark M., 1st Lieut., Beaver Dam, Wis., 33d Division, Camp Forrest, Tenn.

TEPPER, Sidney M., 1st Lieut., Chicago, Station Hospital, Fort Sill, Okla.
 VACANTE, Anthony B., 1st Lieut., Chicago, 12th Station Hospital, Camp Forrest, Tenn.
 WEIDNER, Morris R., 1st Lieut., Dolton, Ill., 135th Medical Regiment, Camp Shelby, Miss.
 WELSH, Sylvester M., Captain, Prairie du Chien, Wis., 29th Division, Fort Meade, Md.

WERBEL, Ernest W., 1st Lieut., Chicago, 135th Medical Regiment, Camp Shelby, Miss.
 WYNES, Maurice C., 1st Lieut., Saginaw, Mich., 3d Armored Division, Camp Polk, La.
 YOUNG, Leslie W., 1st Lieut., Fairfield, Ill., Selfridge Field, Mount Clemens, Mich.
 ZMYSLONY, Walter P., Captain, Milwaukee, 33d Division, Camp Forrest, Tenn.
 ZURFLI, Clarence J., 1st Lieut., Chicago, 29th Division, Fort Meade, Md.

Orders Revoked

ALTMAN, Harrie P., 1st Lieut., Marengo, Ill.
 BERRY, Leonidas H., 1st Lieut., Chicago.
 CRAMER, Oliver S., 1st Lieut., Detroit, Selfridge Field, Mount Clemens, Mich.
 FORKOSH, Sydney R., Captain, Chicago, 30th Division, Fort Jackson, S. C.
 HOHMAN, Roy M., 1st Lieut., Chicago.
 KACZKOWSKI, Joseph C., Major, Chicago, 9th Station Hospital, Fort McClellan, Ala.
 KATZ, Charles, 1st Lieut., Chicago.
 KAUFMAN, Lawrence W., 1st Lieut., Milwaukee.
 KETTERER, Walter R., 1st Lieut., Breese, Ill.
 LANE, Milton, 1st Lieut., Bay City, Mich., 27th Division, Fort McClellan, Ala.
 LEAVITT, Samuel S., 1st Lieut., Orland Park, Ill.
 MATEJKA, James J., Jr., 1st Lieut., Chicago.

MILLER, Donald Sidney, 1st Lieut., Chicago.
 MOORE, Eugene F., Captain, Collinsville, Ill., 29th Division, Fort Meade, Md.
 MULLEN, John P., 1st Lieut., Chicago.
 MYERS, William H., Captain, Coal Valley, Ill.
 NESBITT, William E., 1st Lieut., Alpena, Mich., Station Complement, Camp Wheeler, Ga.
 OSTRANDER, Robert A., 1st Lieut., Ludington, Mich.
 PARKER, Elliott F., 1st Lieut., Moline, Ill.
 PISZCZEK, Edward A., 1st Lieut., Chicago.
 RETTIG, Frank E., Captain, Wauwatosa, Wis., 29th Division, Fort Meade, Md.
 WESCOTT, Royal J., 1st Lieut., Marquette, Mich., 11th Station Hospital, Fort Custer, Mich.
 WORDEN, Robert W., 1st Lieut., Chicago, 207th General Hospital, Camp Livingston, La.
 WRIGHT, Marvin, 1st Lieut., Rhinelander, Wis.

NINTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Ninth Corps Area, which comprises the states of Washington, Montana, Oregon, Nevada, Utah, California and Idaho:

ANTONINI, Charles John, 1st Lieut., San Francisco, 40th Division, Camp San Luis Obispo, Calif.
 AUERBACH, Joseph, 1st Lieut., San Francisco, 40th Division, Camp San Luis Obispo, Calif.
 BERKOVE, Alfred B., Captain, Oakland, Calif., Camp San Luis Obispo, Calif.
 BERMAN, Harry, Captain, Ogden, Utah, Station Hospital, March Field, Calif.
 BRYANT, Frank A. M., Captain, Los Angeles, Camp San Luis Obispo, Calif.
 BURGER, Raymond A., 1st Lieut., West Los Angeles, Calif., 9th Army Corps, Fort Lewis, Wash.
 CARLQUIST, John H., 1st Lieut., Salt Lake City, Camp Roberts, Calif.
 CONLAN, Francis J., 1st Lieut., San Francisco, Camp San Luis Obispo, Calif.
 CULLINORE, Leland K., 1st Lieut., Tacoma, Wash., Camp Roberts, Calif.
 ENNENS, Thomas H., 1st Lieut., Medford, Ore., Station Hospital, Fort Lewis, Wash.
 FRANCIS, Horace M., Colonel, Corvallis, Ore., Station Hospital, Fort Lewis, Wash.
 GANS, Paul J., 1st Lieut., Lewiston, Mont., 9th Army Corps, Fort Lewis, Wash.
 GORDON, Jack D., 1st Lieut., French Camp, Calif., Camp San Luis Obispo, Calif.
 HONEYCUTT, Charles F., Jr., 1st Lieut., Missoula, Mont., Camp San Luis Obispo, Calif.
 JACKSON, Henry M., Captain, Salt Lake City, 9th Army Corps, Fort Lewis, Wash.
 KLAUSNER, John T., Captain, Los Angeles, Hamilton Field, Calif.
 LEWIS, Charles F., 1st Lieut., Oakland, Calif., Camp San Luis Obispo, Calif.

MEEHAN, Carl W., 1st Lieut., Sacramento, Calif., 9th Army Corps, Fort Lewis, Wash.
 MEYER, Emerson L., 1st Lieut., Healdsburg, Calif., Camp San Luis Obispo, Calif.
 MICHELS, Leon M., Captain, San Francisco, Camp San Luis Obispo, Calif.
 MILLER, Clark R., 1st Lieut., San Francisco, Camp San Luis Obispo, Calif.
 MORRIS, Francis B. O'N., 1st Lieut., Los Angeles, Camp San Luis Obispo, Calif.
 NETHERY, Robert D., 1st Lieut., Covina, Calif., Hamilton Field, Calif.
 OVSEY, Lionel, 1st Lieut., Los Angeles, Camp Haan, Riverside, Calif.
 PETEREFY, Richard A., Captain, Los Angeles, Camp San Luis Obispo, Calif.
 POTTER, Clarence G., Captain, San Francisco, Hamilton Field, Calif.
 ROBINSON, Hewitt H., Major, Oakland, Calif., Corps Area Service Command, Fort Ord, Calif.
 SKEOCH, Gordon D., 1st Lieut., Los Angeles, Corps Area Service Command, 1962, Fort Ord, Calif.
 STANSBURY, John R., 1st Lieut., Santa Barbara, Calif., Camp San Luis Obispo, Calif.
 TUCKER, Edwin W., 1st Lieut., Visalia, Calif., Camp San Luis Obispo, Calif.
 WALSH, Alton L., 1st Lieut., Portland, Ore., 203d General Hospital, Fort Lewis, Wash.
 WHITELEY, Edward J., 1st Lieut., Fort Baker, Calif., Camp San Luis Obispo, Calif.
 YOST, Ralph E., 1st Lieut., Glendale, Calif., March Field, Calif.

Orders Revoked

COLLINS, Robert F., 1st Lieut., North Hollywood, Calif.
 WASSERMAN, Sidney E., Captain, March Field, Calif.

Relieved from Duty

COULTER, James D., Captain, Fort Ord, Calif.
 DALE, Earl E., Major, Fort Missoula, Mont.
 KARLEEN, Philip E., Captain, Fort Ord, Calif.
 PITMAN, H. T., 1st Lieut., Fort Ord, Calif.

ORDERED TO AND FROM FOREIGN DUTY

BEATY, Sam, 1st Lieut., M. R. C., U. S. Army, from Fort Sam Houston, Texas, to the Puerto Rican Department, sailing from Charleston, June 20.
 BOAL, Robert W., M. C., U. S. Army; FUGELSO, Erling S., M. C., U. S. Army; KELLEY, Robert R., M. C., U. S. Army; KIND, Henry A., M. C., U. S. Army; KIRKMAN, Lewis W., M. C., U. S. Army, and RICHMOND, Albert M., M. C., U. S. Army.
 BRADFORD, Aubrey L., Major, M. C., U. S. Army, from Washington, D. C., to the Panama Canal Department, sailing from New York, July 17.
 BROWNING, John R., 1st Lieut., M. R. C., U. S. Army, from Camp Upton, N. Y., to the Hawaiian Department, sailing from New York, June 26.
 COCKERHAM, Howard L., Jr., 1st Lieut., M. R. C., U. S. Army, from Fort Belvoir, Va., to the Hawaiian Department, sailing from New York, June 26.
 EVANS, Charles W., Jr., 1st Lieut., M. R.-C., U. S. Army, from El Paso, Texas, to the Puerto Rican Department, sailing from Charleston, S. C., June 20.
 FENTON, Bryan C. T., Captain, M. C., U. S. Army, from Hawaiian Department to the Office of the Surgeon General, Washington, D. C.
 FREED, Albert E., 1st Lieut., M. R. C., U. S. Army, from Fort Leavenworth, Kan., to the Hawaiian Department, sailing from New York, June 26.

GARRETT, Robert T., 1st Lieut., M. R. C., U. S. Army, from Washington, D. C., to the Hawaiian Department, sailing from San Francisco, July 16.
 GRIGSBY, Kenneth R., Captain, M. R. C., U. S. Army, from Fort Crook, Neb., to the Panama Canal Department, sailing from New York, June 26.
 HENDRICKSON, Harvey F., Major, M. C., U. S. Army, from Panama Canal Department to Port of Embarkation, Brooklyn.
 HOUSE, Rex, Captain, M. C., U. S. Army, from Washington, D. C., to the Panama Canal Department, sailing from New York, June 26.
 JOHANNES, Henry C., Lieut. Colonel, M. C., U. S. Army, from Hawaiian Department to San Francisco Port of Embarkation, Fort Mason, Calif.
 KING, John H., Jr., Captain, M. C., U. S. Army, from Philippine Department to Army Medical Center, Washington.
 MILHOLLAND, Arthur V., 1st Lieut., M. R. C., U. S. Army, from Fort Belvoir, Va., to the Hawaiian Department, sailing from New York, June 26.
 NOE, Joe T., Jr., 1st Lieut., M. R. C., U. S. Army, from Fort Knox, Ky., to the Panama Canal Department, sailing from New York, June 26.

POWER, William J., Captain, M. C., U. S. Army, from Panama Canal Department to Port of Embarkation, Brooklyn.
RAMSAY, Lewis C., 1st Lieut., M. R. C., U. S. Army, from Fort McClellan, Ala., to the Hawaiian Department, sailing from Charleston, S. C., June 28.
RICHARDSON, Frank L., M. R. C., U. S. Army, from Fort Ord, Calif., to the Philippine Department, sailing from San Francisco, June 5.
RIZZOLO, John, 1st Lieut., from Aberdeen Proving Ground, Md., to the Philippine Department, sailing from San Francisco, July 17.

SMITH, Wilson T., Captain, M. C., U. S. Army, from Hawaiian Department to Letterman General Hospital, San Francisco.
TONEY, William E., 1st Lieut., M. R. C., U. S. Army, from Camp Joseph T. Robinson, Ark., to the Hawaiian Department, sailing from Charleston, June 28.
VADALA, Anthony J., Lieut. Colonel, M. C., U. S. Army, from Panama Canal Department to Port of Embarkation, Brooklyn.
WILLIAMS, Martin P., Captain, M. R. C., U. S. Army, from Fort Knox, Ky., to the Hawaiian Department, sailing from New York, June 26.

MEDICAL FINDINGS OF INDUCTION BOARDS IN NEW YORK CITY

A report submitted by Col. Samuel J. Kopetzky, chief of the Medical Division of the New York City Selective Service Administration, covering the first fourteen induction periods up to June 30, 1941, shows that 115,569 registrants were examined, of whom 42.8 per cent classified on the basis of their physical examination were inducted into the army; 30.26 per cent were qualified for limited military service only and 26.85 per cent were disqualified for any military service. Of the 34,977 registrants qualified by the board for limited military service, 28,163 registrants had only one physical defect and 21,367 of the 31,025 registrants disqualified for any military service had only one defect. It would seem likely, therefore, that a much greater number of the men could be treated and made available for service under class 1-A than for 1-B. A prehabilitation program, therefore, has been set in motion whereby the practical means to arrange for the treatment of registrants will be available, Col. Arthur McDermott, New York City Selective Service director, said. A medical social worker will be attached to each local board and, with the registrant's consent and the recommendation of the examining physician, will make arrangements for the registrant to receive treatment either from a private physician or, if he cannot afford to pay, at a clinic. Thus many of the men now medically unfit for military service can be treated so they will qualify for limited service at least. Colonel McDermott added that the future usefulness of these young men to themselves and to society and the health of the nation are as much involved as national defense. However, a man may have only one defect which may not be remediable and a man may have more than one defect and each one of them may be remediable and be cured. Among the defects easily remedied so that those having one or more could be put into condition for class 1-A are hernia, varicocele, gonorrhea, syphilis, infected gums and the replacing of extracted teeth with bridges.

The most frequent causes for qualifying a registrant for limited military service are defects of the eyes and teeth, 10.39 per cent and 9.39 per cent respectively, defects of the extremities 4.19 per cent, of the genitourinary organs and venereal disease 3.63 per cent, and abdominal organs and abdominal wall 3.56 per cent.

The most frequent reasons for disqualifying a registrant for military service (class IV-F) were defects of the heart and blood vessels 10.61 per cent, defects of the extremities 4.04 per cent, mental and nervous disorders 4.98 per cent, and defects of the ears 3.39 per cent, of the eyes 3.13 per cent, of the teeth 2.13 per cent and of the lungs 2.10 per cent.

This report, which was prepared under the supervision of Dr. Arthur M. Tiber, throws light on the health of New York City registrants as affected by tuberculosis, syphilis and psychiatric disorders. A special study of pulmonary tuberculosis among an unselected group of registrants from local Board 1 (lower Broadway, Chinatown and part of Mulberry Street) made by roentgen ray examination showed that of 1,090 men examined 8.7 per cent had pulmonary tuberculosis, which disqualified them for any military service. Colonel Kopetzky pointed out that Local Board 1, while typical of the city as far as the percentage of men accepted for full military training goes, has a higher percentage of those medically unfit for any kind of service than any other board in the city. Local Board 1 cannot, therefore, be considered typical of the registrants as a whole as regards pulmonary tuberculosis. However, used as a basis for estimation, about 6.5 per

cent of all New York City registrants between 21 and 36 would have pulmonary tuberculosis to an extent that would disqualify them for service.

The syphilis picture for New York City is encouraging, as only 1.65 per cent of the 115,569 registrants examined had two positive serologic tests for syphilis, and of these 1,687 were qualified for limited military service and only 216 disqualified for any military service.

Every registrant sent to the induction station has a psychiatric examination there. At the local boards, however, only those receive a psychiatric examination who in the opinion of the examining physicians need it. According to this report, only 233 registrants were placed in class 1-B because of mental and nervous disorders of a mild character, while 5,759 were disqualified for any kind of military service on account of severe mental and nervous disorders.

This statistical report is based solely on the record put on form D. S. S. 200 and is concerned only with the final physical classification into which the registrant has been placed. When a registrant is rejected at the induction examination and he has a temporary illness, his D. S. S. form 200 is held at the local board until he recovers. Later, after again being examined at the induction station, he is often accepted.

During the period under survey by this report, an experimental preinduction examination station was functioning in this area. This station was established to determine the practicability of having a preinduction medical examination to provide the registrant with more time to settle his individual affairs if he passed the physical test, and to obviate the necessity of returning him to civil life because he was rejected after he had made all arrangements to enter the army. This plan has worked well. In addition to the registrants previously cited, 3,583 were examined and accepted for full military duty at the preinduction station and are now waiting induction when the local time interval shall have elapsed before going directly into service.

CCC CAMPS

The appropriation approved by Congress for the current fiscal year provides for the maintenance of one thousand, two hundred and thirty-six CCC camps throughout the country and an average total enrolment of two hundred and thirty-two thousand, five hundred enrollees. The strength of the CCC on July 20 was about one hundred and ninety thousand, but it is estimated that four hundred and fifty thousand young men and war veterans will receive training useful in national defense during the current fiscal year. Of the one thousand, two hundred and thirty-six camps, about one hundred will be assigned to work on military reservations, army hospitals and so on to expand the facilities for the enlarged army. Seven hundred and ninety-three camps have been assigned to work supervised by the Department of Agriculture, and three hundred and eighty-six camps to work supervised by the Department of the Interior. Twelve New England camps are scheduled for closing after August 1. One of the major types of work to be carried on will be the protection of timber areas, including forest fire fighting, fire hazard reduction, the construction of truck trails, telephone lines, fire breaks and lookout towers and erosion control. During September they will begin the planting of trees, grasses and shrubs and the development of recreational areas in forests and parks and of refuges for wild life.

The CCC training program will center around courses useful in national defense and after-work classes will be conducted in every camp. There will be one hundred and seventy-six

special CCC schools and shops for training in radio operation, automobile mechanics, cooks and call clerks, while other national defense courses will be given to about forty thousand enrollees in cooperation with neighboring vocational schools.

EXAMINATION FOR APPOINTMENTS IN THE NAVY

An examination will be held at all of the larger naval hospitals and at the Naval Medical Center, Washington, D. C., for appointments as acting assistant surgeon for intern training and as assistant surgeon. For the former position, examinations will be held Oct. 6-9, 1941 and Jan. 5-9, 1942 and for the latter Aug. 11-15, 1941, Oct. 6-9, 1941 and Jan. 5-9, 1942. Applications for authorization to take the examination must be in the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., three weeks prior to the examination. The bureau will forward application forms on request and, in addition, a circular of information for applicants listing details concerning physical requirements, professional examination, rates of pay, and promotion and retirement data. Applicants for appointment as acting assistant surgeon for intern training are required to be citizens of the United States of over 21 but less than 32 years of age, members of the junior or senior classes in class A approved medical schools and to meet the physical and other requirements for appointment. For appointment as assistant surgeon applicants are required to be citizens of the United States of over 21 but less than 32 years of age, graduates of approved medical schools, to have had at least one year of intern training in a hospital accredited for intern training by the Council on Medical Education and Hospitals of the American Medical Association and to meet the physical and other requirements.

MISS BARBER APPOINTED FOOD CONSULTANT

Miss Mary I. Barber, Battle Creek, Mich., president of the American Dietetic Association, has returned to the War Department as food consultant to the Secretary of War and has been assigned to the subsistence branch of the Quartermaster Corps. Last winter she was an appointee of the Office of Production Management, assigned to the Quartermaster Corps. Miss Barber will assist with menus to see that men in military camps are getting both a tasty and a well balanced diet and will give talks before various agencies throughout the country. According to the Bureau of Public Relations of the War Department, more than a hundred members of the American Dietetic Association are employed in army hospitals; one has gone overseas with the Harvard medical units and a hundred and ninety-four are enrolled with the American Red Cross, forming a reserve which the army can call on in case of emergency.

MORE RECREATIONAL AREAS

Six more recreational areas were authorized for construction, the War Department announced July 16. The location of the new camps and their week end capacities are: Los Angeles one thousand, Fort Worth, Texas, five hundred, Oklahoma City five hundred, Kansas City, Mo., one thousand, Island Beach, N. J., five hundred and Lake Brownwood, Texas, one thousand. The week end camps are established to give soldiers free recreation facilities while on leave from their regular stations and the only cost to them is for food, which is available also at a nominal figure. Seven recreational camps are already in full operation along the gulf of Mexico, and work on fifteen others is being rushed. The new recreational camp near Washington, D. C., which will accommodate one thousand men over the week end, was dedicated on July 26. This camp is across the Potomac and north of the western approach to the Arlington Memorial Bridge, within walking distance to the Washington downtown district and affording views of the Lincoln memorial, Washington monument and the capitol dome, and yet it is located away from the dense traffic areas. The recreation camps are of permanent tent type construction, all camps being floored, framed and screened.

INTENSIFIED PROGRAM TO RECRUIT NURSES

At a conference in Washington about three weeks ago, the principal nursing groups working on national defense—National Committee on Red Cross Nursing Service, Nursing Council on National Defense and the Subcommittee on Nursing of the Health and Medical Committee of the Federal Security Agency—outlined an intensified program of nursing recruitment and of mobilizing the country's nursing strength during the present emergency. Congress recently appropriated \$1,200,000 for training nurses for national defense. This fund will be used for increasing the number of students in basic nursing education programs, in preparing inactive graduate nurses for active duty and in offering postgraduate instruction in special fields of nursing. These funds are being administered by the U. S. Public Health Service, which has sent letters to all accredited schools of nursing to learn how each school may help in expanding the nation's nursing strength. Those plans submitted by various institutions which provide for the most effective and economical increase in qualified nurses will be given preference. Thomas Parran, Surgeon General of the U. S. Public Health Service, requested the appointment of three prominent nursing administrators now associated with civilian institutions to assist in the administration of the program.

THE DENTAL CORPS RESERVE

Before the present emergency there were two hundred and sixty-eight officers in the dental corps of the army and about four thousand dentists on the roll of the Dental Reserve Corps, of whom about two thousand, the War Department announced July 20, have been called to active duty. About one hundred and fifty dentists have been inducted into the army under the Selective Service and Training Act, and nearly all of them have made application for commissions. The first dentist to rise from the ranks under a new regulation permitting qualified trainees to accept commissions in the Dental Corps Reserve and to be ordered to active duty is Private Milton P. Paperth, a dentist from New Jersey now on duty at the Station Hospital, Fort Dix, N. J. Each of the one hundred and fifty dentists inducted into the army and who have now applied for commissions will be passed on by an army medical examining board and if approved will be appointed a First Lieutenant in the Dental Reserve Corps. Because the new regulation is designed to provide commissions for all qualified inducted dentists, for the present no more civilian dentists will be taken into the Dental Corps Reserve.

THE INTENSIFIED MOSQUITO CAMPAIGN

An intensified effort is getting under way to eradicate mosquitoes in and near the training centers throughout the United States and its possessions. There are fifty-three troop centers having more than ten thousand men each, and to carry out the antimosquito campaign successfully it is estimated that \$250,000 a month will be required. In the 1942 army appropriation bill \$1,192,000 will be appropriated for this work, and of this amount \$442,000 will be turned over to the medical department and \$750,000 to the quartermaster department, which will perform the patrol work under the supervision of the medical department. Eighty-seven sanitary engineers, all eradication experts, have been assigned to the camps to supervise this work, all of which will be done by civilian specialists and laborers. Soldiers will not be used for this work.

MEDICAL BOARD FOR CIVILIAN DEFENSE

A medical board to devise uniform procedure for protection of civilians in an emergency was recently appointed by the Office of Civilian Defense with the following members: Drs. Elliott C. Cutler, Boston; George Bachr, New York; Oliver B. Kiel, Wichita Falls, Texas, and Albert S. McCown, Washington, D. C.

ORGANIZATION SECTION

COURTS AND THE UNIONIZATION OF HOSPITAL EMPLOYEES

PREPARED BY THOMAS V. McDAVITT, BUREAU OF LEGAL MEDICINE AND LEGISLATION,
AMERICAN MEDICAL ASSOCIATION, CHICAGO

The administrative personnel and governing boards of nongovernmental hospitals are increasingly concerned with the possibility of being confronted with demands in connection with the attempted unionization of the maintenance and other nonprofessional employees of their hospitals, and with their legal right to resist such activities. Since most private, nongovernmental hospitals depend on public donations or endowments to continue operations, and since it is practically impossible under present conditions to obtain increased donations or endowments from the public, the enforcement of demands concomitant with unionization, which almost inevitably increases operating expenses substantially, may well render affected hospitals less able to carry on their essential functions and result in a diminution in the quantity and quality of hospital services.

These so-called unionization demands stem essentially from the enactment in eight states¹ since 1937 of state labor relations acts,² sometimes referred to as little Wagner acts since they are patterned on the Wagner National Labor Relations Act.³ Generally speaking, these acts create a state agency, generally referred to as a state labor relations board, with specified powers to prevent designated "unfair labor practices," one of which invariably is a refusal by an employer to bargain collectively with employees or with a union selected by the employees as their bargaining agency. Generally by these acts if a particular employer refuses to bargain collectively with his employees or perpetrates any other stated "unfair labor practice," the employees, or persons or agencies purporting to act for them, may appeal to the state labor relations board, which may order an employer to cease from carrying on the "unfair labor practices" complained of and may obtain the aid of courts in the enforcement of its order. The effect of these laws, then, is to require an employer to do certain acts in connection with his relations with his employees, which without the existence of the laws in question he could not be compelled legally to perform.

Another factor tending toward the assertion of labor demands in this connection is the enactment also in recent years of so-called labor anti-injunction acts in about twenty-five states, the general effect of which is to limit the right of state courts, or to hamper such courts, in granting injunctions in cases involving labor disputes.

Physicians and hospital boards and administrators have generally assumed that these laws have no application to a hospital, relying on an understanding or belief that these statutes deal primarily with labor disputes in industry and that a hospital is not an industry in any proper sense of the word. Recent

court decisions (abstracts of three of which appear in this week's issue of THE JOURNAL) cast considerable doubt on the soundness of such an assumption. The problems involved merit thoughtful consideration and analysis.

State courts of appellate jurisdiction have considered to date 4 cases involving the applicability of state labor relations acts and labor anti-injunction acts to what essentially were attempts to press the unionization of maintenance and nonprofessional employees of hospitals and the resistance of the hospitals concerned to the unionization activities involved. It may be impossible, because of the variance in the phraseology of the applicable laws of the states in which the cases arose, to formulate accurately from an analysis of those cases and the applicable statutes any general statement that will anticipate court holdings in other states having similar laws. At any rate a discussion of the issues involved in each case would seem timely.

The first instance in which a court of appellate jurisdiction passed on the legal right of a hospital to resist unionization activities occurred in December 1937 when the supreme court, appellate division, second department, New York, in *Jewish Hospital of Brooklyn v. Doc*, 300 N. Y. S. 1111; J. A. M. A. 111:475 (July 30) 1938, held that the New York labor anti-injunction act, which limited the right of a state court to issue injunctions in labor disputes, did not prohibit the issue of an injunction asked by a charitable hospital to restrain a local union and its members, allegedly composed in part of 10 per cent of the maintenance and nonprofessional employees of the hospital, from engaging in certain activities in connection with attempts at unionization, such as disorderly mass picketing, intimidation, sit down activities and assaulting employees who refused to join the union. The court said:

We believe, even though the statute does not expressly exempt charitable corporations, that the Legislature never intended it to apply to an institution such as plaintiff [*Jewish Hospital of Brooklyn*]. While those involved in a labor dispute, as defined by the statute, need not stand in the relation of employer and employee, they must be engaged in the same "industry, trade, craft or occupation." These words connote and emphasize one common thought, to wit, that the parties to the controversy shall be engaged in the same business enterprise or commercial pursuit; one motivated by the desire for profit, the other by the desire to earn a livelihood. . . . Obviously plaintiff is not engaged in any industry, trade, craft, or occupation for profit within the meaning of the statute.

But before we conclude that this case is authority for the proposition that a charitable hospital is immune from the provisions of a labor anti-injunction act or a state labor relations act, the case must be evaluated with these additional factors in mind:

1. The New York anti-injunction and labor relations acts were held to be in *pari materia*—that is, to be read as one and construed together—and the state labor relations act—different in this respect than any other state labor relations

1. Massachusetts, Michigan, Minnesota, New York, Pennsylvania, Rhode Island, Utah, Wisconsin.

2. Somewhat similar to these acts is also a "Labor Mediation Act" in New Jersey, which, however, lays a primary stress on arbitration alone.

3. The National Labor Relations Act applies also to the District of Columbia.

act—contains a specific exemption in favor of a charitable association, corporation or enterprise.

2. The charitable hospital in this case, it was held, discharged in part, at least, a function which ordinarily devolves on the government in that at a loss it cared for certain patients sent to it for treatment by the city and with respect to whom the city was bound to provide care. It seemed admitted that public policy at least excluded the state and its political subdivisions from the operation of the statutes involved.

A careful reading of the case then indicates that in New York the two statutes concerned would not apply probably to a nonprofit corporation, since the statutes essentially apply only where the employer is "motivated by the desire for profit." Certainly there would be no application where in addition the nonprofit corporation is performing in part a governmental function. Obviously, then, there would seem to be no exception with respect to a private hospital operated for profit and the two acts (the labor relations act and the anti-injunction act) would apply to such a hospital. That is precisely what was held on April 14, 1941 by the supreme court, appellate division, second department in *State Labor Relations Board v. McChesney*, 27 N. Y. S. (2d) 870 (abstracted this issue of THE JOURNAL, p. 473). The court in that case held that the New York labor relations act applies to "labor conditions in any field of employment where the objective is the earning of a livelihood on one side and the gaining of a profit on the other," and that a private hospital operated for profit was subject to the act and must comply with an order of the State Labor Relations Board requiring it to cease refusing to bargain collectively with its employees.

Next, the Supreme Court of Pennsylvania, Jan. 6, 1941, in *Western Pennsylvania Hospital et al. v. Lichter*, 17 A. (2d) 206 (abstracted in this issue on page 475 and commented on editorially in THE JOURNAL Jan. 18 and June 21, 1941) upheld the action of a trial court in enjoining the Pennsylvania Labor Relations Board and a certain union from exercising jurisdiction and asserting rights, respectively, under the Pennsylvania state labor relations act in an attempt to unionize maintenance and nonprofessional employees of some twenty-five nonprofit, charitable hospitals. The Pennsylvania act, unlike the New York labor relations act, contains no express exemption in favor of charitable corporations and the reasoning employed by the court in arriving at a conclusion that the state labor relations and labor anti-injunction acts did not apply to the plaintiff hospitals is most significant. The labor anti-injunction act, the court held, did not apply since a labor dispute, within the meaning of that act, was not involved because under the act "A case shall be held to involve or to grow out of a labor dispute when the case involves persons who are engaged in a single industry, trade, craft, or occupation . . ." and, in the words of the court:

A hospital is not an industry. Neither are the employees of a hospital engaged in a single trade, craft or occupation. Student nurses, interns, doctors, surgeons, clerks, stenographers, bookkeepers, elevator operators, ambulance drivers, laundresses, mechanics, technicians, char-women and others may be employed by a hospital. They may have a common employer but they have no single trade, craft or occupation. Giving the words "industry, trade, craft or occupation" their commonly accepted meaning, we feel that they do not include the operations of a hospital.

The court then held that, even if the words of the Pennsylvania labor relations act were interpreted as

broad enough to include the operations of a hospital, still the act would have no application since, following the holding of the United States Supreme Court in *Holy Trinity Church v. United States*, 143 U. S. 457, 12 S. Ct. 511, a thing may be within the letter of a statute and yet not within the statute because not within its spirit. In this connection the court said:

Hospitals are scientific institutions created for a humane purpose in amelioration of the sufferings of mankind. They require for their successful operation highly skilled physicians, surgeons, technicians, experts and nurses. They likewise require the services of other persons, some of whom may be skilled and some unskilled. But the whole must be coordinated, controlled and uninterrupted to accomplish the general purpose. This would be impossible, should we hold the Labor Act applicable with all its attending ramifications, interruptions and possible cessation of service due to labor disputes and attending financial inability to function. Surely the Legislature had no such intention and we cannot so find in the absence of a clear and positive declaration to that effect.

Moreover, most of the hospitals involved in the Pennsylvania case, the court held, were, as in the Jewish Hospital of Brooklyn case, engaged in a governmental function in that they cared for persons for whom the state had an obligation to care and received from the state appropriations which only in part reimbursed them for the costs of the services rendered to those patients. In so doing, they were governmental agencies and were exempt from the provisions of the two acts in question.

It is difficult, if not impossible, to evaluate the weight to be given to the presence of the factor of governmental agency present in this case. Without the presence of that factor and in view of the reasoning involved in the argument that the hospitals were not within the act because not within the intent of the legislature in enacting the labor relations act, a plausible argument in favor of the exemption even of private hospitals operated for profit in Pennsylvania might be convincingly advanced and possibly still can be. At least, however, it would seem to follow from the decision that in the future the Pennsylvania Supreme Court will regard a nonprofit charitable hospital, even though it does not carry on any governmental function (and it will be noted that a few of the hospitals involved in the Pennsylvania case carried on no governmental function), as exempt from the provisions of the Pennsylvania labor relations act and the Pennsylvania anti-injunction act.

The Pennsylvania case would seem to indicate that the court of another state having a state labor relations act or a similar anti-injunction act should in all logic reason likewise and accord exemption to a nonprofit charitable hospital. However, much as the logic of such a conclusion would strike one, the fact remains that the Supreme Court of Minnesota on Oct. 11, 1940 in *Northwestern Hospital, Minneapolis, Minn. v. Public Building Service Employees' Union Local No. 113 et al.*, 294 N. W. 215 (abstracted in this issue on page 474) rejected the argument and holding of the Pennsylvania case and squarely held that the Minnesota labor relations act applied to a labor dispute between an admittedly nonprofit, charitable hospital and its employees. In arriving at this conclusion the Minnesota court said:

The logical starting point for an examination is with the definitions of employer and employee in the Labor Relations Act.

3. Mason Minn. St. 1940 Supp. Sec. 4254-21, provides, "(b) 'Employer' includes all persons employing others . . . but does not include the state or any political or governmental subdivision thereof, nor any person subject to the Federal Railway Labor Act, . . ."

"(c) 'Employee' includes, in addition to the accepted definition of the word, any employee whose work has ceased because of any unfair labor practice . . . but does not include any individual employed in agricultural labor or by his parent or spouse or in domestic service of any person at his own home."

There cannot be doubt that both definitions are comprehensive in substantive nature, in fact, so much so that they force the conclusion that a nonprofit, charitable corporation operating a hospital is within the act as one "employing others." Equally certain is the proposition that one employed as an elevator operator, as a janitor or in a similar occupation is an "employee" within the accepted meaning of that term.

It may well be, however, that still other state courts would follow the Pennsylvania decision rather than the Minnesota because the Minnesota decision may possibly be justified and distinguished by particular language in the Minnesota labor relations act, which seems practically unique in this respect, providing:—

If the dispute is in any industry, business or institution affected with a public interest, which includes, but is not restricted to, any industry, business or institution engaged in supplying the necessities of life, safety, or health, so that a temporary suspension of its operation would endanger the life, safety, health or well being of a substantial number of people of any community . . .

a committee appointed by the governor should hold a hearing and report on the matter. The Minnesota court placed great stress, as well it might, on the inclusion of "institution," saying:

Since a state institution is within the exemption of the act, we must understand this word to mean what is commonly conveyed by it. A hospital such as plaintiff corporation oper-

ates is generally regarded as an institution in the community. It is not a business or industry but it is concerned with the well-being of the people. The intention of the legislature is more evident when consideration is given to the provision relating to the suspension of activity being a peril to a substantial number of people. It seems very apparent that just such a situation as is now before us was contemplated by this statute. There is a clear recognition that hospitals are within the act.

The presence, then, of the word "institution" would seem practically to have prohibited the Minnesota court from reading an implied exception in favor of nonprofit charitable hospitals, since the legislative intent as to inclusion seemed so evident. It may well be then that, if a particular state labor relations act does not contain any such similar language, the court construing it may be more impressed with the logic of the Pennsylvania court's holding and disregard the Minnesota holding.

In any event, while the situation with respect to nonprofit charitable hospitals in Minnesota, New York and Pennsylvania seems reasonably clear, how the courts of the other five states and the District of Columbia having labor relations acts would hold with respect to the applicability of those acts to nonprofit charitable hospitals is a matter of some conjecture based, possibly, to borrow a phrase current a few years ago, on the "economic predilections" of each particular court. The situation with respect to private hospitals conducted for profit in those states seems somewhat clearer. In principle, private hospitals conducted for profit would seem to be amenable to the labor relations act of the particular state, excepting possibly in Pennsylvania, where a logical extension of the language of the court might call for exemption.

OFFICIAL NOTES

DR. SIDWELL APPOINTED DIRECTOR OF THE CHEMICAL LABORATORY

Albert Edwin Sidwell Jr., Ph.D., has been named Director of the Chemical Laboratory of the American Medical Association. In 1931 Dr. Sidwell was graduated from Brown University, Providence, R. I., with the degree of Bachelor of Science in Chemistry. He received further training in chemistry at the University of Chicago, leading to the degree of Doctor of Philosophy in 1934. He served as assistant in chemistry at Brown University from 1928 to 1931. At the University of Chicago he held appointments as research assistant, research

associate and instructor in chemistry. Dr. Sidwell has been a chemist in the Chemical Laboratory of the American Medical Association since 1938.

Dr. Sidwell has made contributions to the chemical literature in photoelectric spectrophotometry, the chemistry of hemoglobin and other pigments, and oxidation reduction problems. Dr. Sidwell is a member of the honorary society of Sigma Xi, the American Chemical Society and the Chicago Chemists' Club.

The Chemical Laboratory is a unit of the Division of Drugs, Foods and Physical Therapy of the American Medical Association.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—H. R. 3484 has passed the House and is now pending in the Senate with a favorable committee report, providing that army reserve officers who were called or ordered into active military service by the federal government for service in excess of thirty days on or subsequent to Feb. 28, 1925 other than for service with the Civilian Conservation Corps, and who are now disabled from disease or injury contracted or received in line of duty while so employed, shall be entitled to receive the same retirement pay and hospital benefits as are now or may hereafter be provided by law or regulation for officers of corresponding grades and length of service of the regular army. H. R. 5146 has passed the House and is pending in the Senate with a favorable committee report, proposing to authorize an additional appropriation for the purchase of a site on which

to construct a new building for the Army Medical Library and Museum.

Bills Introduced.—H. R. 5445, introduced by Representative Angell, Oregon, proposes to provide certain pensions for all persons who served ninety days in foreign service under the jurisdiction of the Quartermaster General, Surgeon General of the Army, the Secretary of the Navy or Marine Corps, during the Spanish-American War, including the Philippine Insurrection and the Chinese Boxer Rebellion. H. R. 5459, introduced by Representative Lanham, Texas, provides that seeing eye dogs or other guide dogs, specially trained and educated for that purpose, accompanied by their blind masters, shall be admitted to any building or other property owned and controlled by the United States on the same terms and conditions and subject to the same regulations as generally govern the admission of the public to such property.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

New Director of Industrial Hygiene.—Dr. Edwin H. Place, a member of the staff of the division of industrial hygiene, National Institute of Health, Bethesda, Md., has been appointed director of the division of industrial hygiene of the Alabama State Department of Health, it is reported. He succeeds Dr. John R. Cain, Montgomery, who resigned several months ago. Dr. Place graduated at Detroit College of Medicine and Surgery in 1932 and has served as director of the Des Moines County health department in Iowa and in Midland and Dickinson counties in Michigan.

CALIFORNIA

Personal.—Harold E. Jones, Ph.D., director of the Institute of Child Welfare on the Berkeley campus of the University of California, has been appointed a member of the National Research Council in the division of anthropology and psychology.

Plague Infection.—According to *Public Health Reports*, plague infection has been proved by animal inoculation and cultures in a pool of 138 fleas from 8 ground squirrels, *Citellus beecheyi*, received from a ranch south of Davis Ranger Station, Kern County. Plague infection was also proved in organs from a ground squirrel, *Citellus beecheyi*, received from about the same locality.

Criteria Indicating Death.—The San Francisco City Department of Health announces that, after a conference between the chief surgeon of the Emergency Hospital Service and the coroner, criteria indicating death have been accepted. In the future the following signs are to be looked for and checked carefully in every case of death in the institutions of the department of public health. It is mandatory that these signs be checked completely in every instance in which a patient is pronounced dead.

1. Cessation of respiration as determined by:
 - (a) The stethoscope against the larynx.
 - (b) Holding a mirror in front of the nose to note condensation of moisture.
 - (c) Movement of air currents against wisps of cotton placed in the nose.
2. Cessation of heart beat as indicated by testing with the use of a stethoscope placed on the precordium.
3. Cessation of circulation as evidenced by:
 - (a) Opacity of the hands when held up to a bright light.
 - (b) Failure of a bleb to appear on the skin after direct application of burning heat.
 - (c) Lividity and dependent discoloration.
4. Loss of body heat.
5. Rigor mortis.
6. Coarsening of the texture of the conjunctiva (this is not a perfectly reliable sign and neither is the state of the pupil).
7. Body decomposition.

ILLINOIS

Personal.—Dr. Thomas J. Hilliard, Fairfield, was guest of honor at a dinner, July 6, to mark his completion of fifty years in the practice of medicine. He was presented with the certificate and lapel button showing membership in the "fifty year club" of the state medical society. Dr. Leslie W. Young, Fairfield, president of the Wayne County Medical Society, was master of ceremonies.—Dr. Leon J. May, Anna, has been appointed managing officer of the Anna State Hospital, it is reported.

Respirator and Splints Available for Infantile Paralysis Cases.—The Advisory Committee of Physicians to the Cook County chapter of the National Foundation for Infantile Paralysis has notified physicians in Cook County that the chapter has available in its office at 166 West Jackson Boulevard, Chicago (telephone Wabash 8782) a supply of splints which can be obtained on request for use on any infantile paralysis patient regardless of the financial status. If the patient is able to pay for the use of the splints, this will be acceptable but it is not required. The foundation also has purchased two large respirators which are at the call of physicians of Cook County should respiratory paralysis in any patient require the use of such apparatus. Detailed information can be obtained by calling the office of the foundation.

Chicago

Special Society Elections.—New officers of the Chicago Gynecological Society include Drs. Charles E. Galloway, Evanston, president; Edward D. Allen, president-elect; William J. Dieckmann, vice president; Ralph A. Reis, treasurer, and James A. Gough, secretary.—Dr. Andrew C. Ivy was recently elected president of the Chicago Society of Internal Medicine; Dr. Harold C. Lueth, Evanston, vice president, and Dr. Richard B. Capps, secretary-treasurer.

University News.—The University of Illinois has accepted a grant of \$2,000 from Parke, Davis & Company, Detroit toward the support, for the next six months, of research on the pathogenesis and therapy of experimental renal hypertension being conducted in the departments of physiology and physiologic chemistry of the college of medicine by Dr. George E. Wakerlin and Carl A. Johnson, Ph.D. A paper by these authors appears on p. 416 in this issue of THE JOURNAL.

Maternal and Infant Mortality.—Maternal mortality reached the low point of twenty-four deaths per 10,000 live births in Chicago in 1940, according to an announcement from the Joint Maternal Welfare Committee of Cook County. The infant mortality under 1 year of age was 28.8 per thousand live births in 1940, a reduction from the rate of 31.3 for 1939. A noteworthy reduction in the mortality of infants under 1 day of age has occurred, from 15.5 per thousand live births in 1935 to 10.9 in 1940. The stillbirth rate has been reduced from 26.9 per thousand live births in 1935 to 25.4 per thousand live births in 1940.

KENTUCKY

Society News.—The Trigg County Medical Society was organized in Cadiz, July 22, with Drs. George E. Hatcher, Cerulean, as president and Elias Futrell, Cadiz, secretary.—At a meeting of the Tri-County Medical Association composed of Hickman, Carlisle and Ballard counties in Wickliffe in June the speakers were Drs. John F. Dunn, Arlington, on treatment of fractures and Horace E. Titsworth, Clinton, on gastric syphilis.

Dr. Rankin Honored.—The Fayette County Medical Society gave a banquet at the Lexington Country Club, June 30, in honor of Dr. Fred W. Rankin, Lexington, recently named President-Elect of the American Medical Association. Dr. Charles M. McKinlay, Lexington, president of the county society, presided and guests included Drs. Harrison H. Shoulters, Nashville, Tenn., Speaker of the House of Delegates; Elmer L. Henderson, Trustee; Irvin Abell, Past President; James Duffy Hancock, member of the House of Delegates of the American Medical Association, and Arthur T. McCormack, state health commissioner and also a delegate, all of Louisville.

LOUISIANA

Federal Funds for Research.—Tulane University of Louisiana School of Medicine, New Orleans, will receive federal funds to carry on research in the field of malaria control and Charity Hospital, New Orleans, for research in the use of sulfanilamide compounds in treating infections resulting from wounds and burns, newspapers reported. Funds will also be allotted to Tulane for work on malaria control and mosquito control and for the study of roentgen therapy in gas gangrene.

Group to Coordinate Health Activities.—The Louisiana State Council for the Coordination of Health, Welfare and Recreational Activities in National Defense was organized in the offices of Welfare Director W. S. Terry Jr., Baton Rouge, newspapers reported, July 3. C. Ellis Henican, chairman of the state welfare board, was elected chairman of the organization. The council will consist of representatives from area councils which will be set up throughout the state, representatives of all agencies operating in the fields of health, welfare and recreation. It will act only in an advisory capacity to the local groups operating their own programs. An area council is already functioning in New Orleans, it was said.

MAINE

Dr. Bittner Receives Alvarenga Prize.—The College of Physicians of Philadelphia awarded the Alvarenga Prize on July 14 to John J. Bittner, Ph.D., of the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, in recognition of his studies on cancer. Dr. Bittner received his degree of doctor of philosophy at the University of Michigan, Ann Arbor, in 1930. He was assistant in cancer research at Michigan from 1927 to 1930, when he went to the Jackson Memorial Laboratory as research associate. He has been a member of the board of

directors and assistant treasurer there since 1934 and acting treasurer since 1936. He has been special cancer investigator for the U. S. Public Health Service since 1932. Subjects covered by his research include the genetics of transplantable and spontaneous cancer in mice, hybridization and transplantable normal tissue.

MARYLAND

Typhoid Outbreak.—Twenty-three cases of typhoid were reported to the state department of health in an outbreak in the Mount Savage section of Western Baltimore, newspapers reported July 13. The source of the outbreak had not been determined at the time of this report. The first case was reported on June 20. A total of 1,117 persons had been given their first inoculation against the disease and 808 had received their second, the report stated.

MICHIGAN

New Director of Epidemiology.—Dr. Wallace M. Chapman, formerly director of district health unit number 3 at Charlevoix, has been appointed director of the bureau of epidemiology of the Michigan State Department of Health. Dr. James W. Chapman, director of the bureau of maternal and child health of the Missouri State Department of Health, has been named director of the health district, with offices in Charlevoix. The changes were effective on July 1, newspapers reported.

Pathologist Retires from Faculty.—Dr. James E. Davis, for many years professor of pathology at Wayne University College of Medicine, Detroit, has retired from that position. At the recent alumni reunion of the college, Dr. Davis was presented with a gift by Dr. Osborne A. Brines on behalf of the faculty. Dr. Davis graduated in 1896 at Wayne, then known as the Detroit College of Medicine and Surgery. In more recent years he also served for a time on the faculty of the University of Detroit dental department.

MISSOURI

Five Hundred More Beds at St. Louis City Hospital.—A new thirteen story general hospital building costing about \$2,000,000 and containing five hundred beds was dedicated at the St. Louis City Hospital recently. The building includes an emergency suite, surgical pavilion, eye, ear, nose and throat, urologic, gynecologic, obstetric, pediatric, fracture and prison wards, delivery suites, occupational therapy department, physical therapy department and research laboratories. Some features of the building include overhead viewing of surgery, built-in biplane fluoroscope for foreign body localization in the chest and piped gases; for example therapeutic oxygen is piped to the wards. The building is part of a general rebuilding and modernization of the city hospital group, which was initiated with the opening of the Malcolm A. Bliss Psychiatric Institute in 1939. A new power house was the next unit completed, a rebuilt four story outpatient department was occupied in October 1940, and a new service building was opened two months later.

Suit Charging Infringement of Estrone Patent.—A civil action brought by the president and board of trustees of St. Louis University against Hospital Liquids, Inc., New York, charging infringement of letters patent 1,967,350 to Doisy et al. covering the manufacture and sale of estrone (theelin) and estrone (theelin) preparations, was concluded early in March. The plaintiffs and the defendant agreed to a consent judgment involving a cash settlement, the amount of which has not been made known. The consent judgment was entered by Judge John P. Barnes in the United States District Court for the Northern District of Illinois. The consent judgment ordered and adjudged that the plaintiffs are the exclusive owners of United States letters patent 1,967,350, together with the exclusive right to recover damages and/or profits for the infringement thereof. The consent judgment further adjudged that letters patent 1,967,350 is good and valid in law and that the defendant, Hospital Liquids, Inc., had infringed the patent by selling products covered by the claims of the same. The consent judgment further adjudged that the defendant be enjoined and restrained from making, selling or using any of the subject matter as defined by the claims of said letters patent. The action is the first thus far brought on behalf of St. Louis University for infringement of letters patent 1,967,350, which covers the manufacture of the isolated crystalline hormone (pure crystalline estrone [theelin]).

MONTANA

Personal.—Dr. Thomas W. Collinson has been appointed health officer of Scobey.—Ludvig Gustav Browman, Ph.D., assistant professor of zoology and physiology at Montana State University, Missoula, has received a second grant in aid of \$500 from the National Research Council for the continuation of his research on the effect of light on the growth and activity of rats, according to *Science*.

NEW YORK

Hospital Lacks Residents.—The Rochester General Hospital, Rochester, reported in its *News Letter* recently that the national emergency has made vacancies in its residencies in medicine, orthopedics, obstetrics and ophthalmology. Of eight new interns who reported for duty on July 1, four hold commissions in the Medical Reserve Corps and presumably will be allowed to complete only one year of the two year appointment, it was said.

New Hospital Building.—Ground was broken for a new building for St. Mary's Hospital, Rochester, at a recent ceremony. The new home of the 84 year old hospital will have a capacity of three hundred and seventy-five beds and will cost about \$1,000,000. It will be in a novel design described as an "end to end Y," with six floors. The present building will be used for the outpatient department, for educational purposes and as a meeting place for groups affiliated with the hospital.

Annual Chautauqua Meeting.—The annual Interstate Medical Meeting sponsored by the Medical Society of Chautauqua County was held in Chautauqua, July 30. The morning program began with a round table discussion of "Treatment of the Menopause," by Drs. Louis A. Siegel, Francis D. Leopold and Gilbert M. Beck, Buffalo, as participants. Drs. Arthur C. Ernest and George Crile Jr., Cleveland, made addresses on medical and surgical aspects, respectively, of "The Present Status of Chemotherapy," with Dr. George W. Cottis, Jamestown, president-elect of the Medical Society of the State of New York, opening the discussion, and Dr. Morris Fishbein, Chicago, Editor of *THE JOURNAL*, gave an address entitled "American Medicine Prepares." In the afternoon Dr. Fishbein spoke at a public meeting on "Medicine Moves Forward." At a luncheon at the Hotel Athenaeum Dr. William D. Johnson, Batavia, was the speaker.

New York City

Three New Appointments at Cornell.—Appointments to three professorships have been announced by Cornell University Medical College. Dr. William Dock, professor of pathology at Stanford University School of Medicine, and pathologist to the Stanford University Hospitals in San Francisco, has been appointed professor of pathology at Cornell and pathologist to New York Hospital. Dr. Dock graduated from Rush Medical College, Chicago, in 1923 and joined the Stanford faculty in 1926 as an instructor. He became professor in 1936. Dr. David P. Barr, Busch professor of medicine at Washington University School of Medicine and physician in chief of Barnes Hospital, St. Louis, has been appointed professor of medicine and physician in chief to New York Hospital. Dr. Barr graduated from Cornell in 1914 and was on the faculty from 1916 to 1924, when he went to Washington University. He now succeeds Dr. Eugene F. Du Bois, who has been made professor of physiology and head of the department of physiology and biophysics. Dr. Du Bois has been associated with Cornell since 1912 except for the war years 1917-1919, when he served in the U. S. Navy. He has been professor of medicine since 1930.

NORTH DAKOTA

Outbreak of Encephalitis.—Twenty-five cases of encephalitis in the period July 1-12 and 35 since the beginning of the year were recently reported to the U. S. Public Health Service by Dr. Maysil M. Williams, state health officer. Seventeen of the cases occurred in Cass County, the first having been reported on July 1. The first 4 of these cases were diagnosed as encephalomyelitis, and a definite history of equine encephalomyelitis was found on the farm where 1 patient lived. Twenty-four of the 35 cases were in adults and 11 in children under 15. Four were in infants 1 year old or younger. For the first six months of 1941 280 cases have been reported for the entire country. For the calendar year 1940 there were 1,217 for the country as a whole.

OREGON

University News.—Dr. Anton J. Carlson, Chicago, delivered the annual commencement address at the University of Oregon Medical School, Portland, June 6, on "A New Frontier in Medicine: The Problem of Subclinical Diseases."

Postgraduate Lectures.—A course of lectures on obstetrics and pediatric surgery was presented during June in ten towns under the auspices of the Oregon State Medical Society in cooperation with the division of maternal and child health of the Oregon State Board of Health. The lecturers were Drs. William J. Dieckmann, associate professor of obstetrics and gynecology, University of Chicago, The School of Medicine, and Herbert E. Coe, Seattle. The towns were La Grande, The Dalles, Bend, Klamath Falls, Medford, Marshfield, Eugene, Salem, Astoria and Portland. This is the second course of its type; the previous one was presented in May 1939.

SOUTH DAKOTA

State Medical Election.—Dr. Nelius J. Nessa, Sioux Falls, was chosen president-elect of the South Dakota State Medical Association at the annual meeting at Mitchell in May, and Dr. Bertrand M. Hart, Oneida, became president. Dr. Joseph C. Ohlmacher, Vermillion, was elected vice president and Dr. Clarence E. Sherwood, Madison, secretary. Next year's meeting will be in Sioux Falls.

TENNESSEE

Joint Health Unit.—A joint health unit for Chattanooga and Hamilton County was placed in operation, July 1, with Dr. Fray O. Pearson, county health director, as director and Dr. William C. Sanford, city health commissioner, as assistant director.

Society News.—Dr. Charles R. Thomas, Chattanooga, addressed the Hamilton County Medical Society in Chattanooga, July 3, on "Pulmonary Embolism in Heart Disease." Dr. Robert C. Robertson spoke, August 7, on "Principles of Fracture Treatment."—Drs. John J. McCaughan and Giles A. Coors, Memphis, addressed the Shelby County Medical Society, July 1, on "Sarcoma of the Vulva" and "Calcification of Ovaries" respectively.

VIRGINIA

New Health Officers.—Dr. Aaron Wilson Brown, formerly of Rochester, Pa., has been appointed venereal disease control officer of Richmond. He succeeds Dr. Clyde F. Ross, who served on a part time basis.—Dr. Arthur H. Cummings, formerly of Binghamton, N. Y., has been appointed health officer of Portsmouth.—Dr. Louise Fry Galvin, Richmond, has been appointed to the newly created position of pediatric consultant of the orthopedic division of the crippled children's bureau in the state department of health.

WASHINGTON

Society News.—Speakers at the final meeting of the season of the King County Medical Society, Seattle, June 2, were Drs. Loren G. Shroat on "Injection Treatment of Hernia"; Souren H. Tashian, "Injection Treatment of Hemorrhoids," and Edwin A. Nixon, "Injection Treatment of Varicose Veins."

WISCONSIN

Teacher of Pharmacy Dies.—Edward Kremers, Ph.D., director emeritus of the school of pharmacy of the University of Wisconsin, Madison, died, July 9, aged 76. Dr. Kremers graduated in pharmacy at Wisconsin in 1886 and took a B.S. degree in 1888 and Ph.D. in 1890 at the University of Goettingen, Germany. He became instructor in pharmacy at Wisconsin in 1890 and two years later became professor of pharmaceutical chemistry and director of the course in pharmacy. In 1913 he started the first pharmaceutical experiment station in the United States and remained its head until his retirement in 1935. Since retiring he had been a member of the state board of pharmacy. Dr. Kremers was chairman of the committee on volatile oils and related subjects of the U. S. Pharmacopeia Revision Committee in 1900-1910. He was co-editor of the Standard National Dispensatory. Many honors had come to Dr. Kremers, including the Remington Medal in 1930, honorary degrees from the University of Michigan and the Philadelphia College of Pharmacy and Science, and honorary membership in French and German societies of pharmacy. He was honorary president of the recently established American Institute of the History of Pharmacy. In 1940 he received a bronze plaque of himself at a testimonial dinner held in Madison by three hundred Wisconsin pharmacists.

WYOMING

Rocky Mountain Medical Conference.—The third biennial Rocky Mountain Medical Conference will be held at the Canyon Hotel, Yellowstone National Park, September 2-4. Included among the speakers will be:

- Dr. Frank H. Lahey, Boston, President of the American Medical Association, Medical Problems of Today; Management of Lesions of the Stomach, Duodenum and Jejunum.
- Dr. John R. Nilsson, Omaha, The Transportation and Treatment of Severe Fractures by the Open Method.
- Dr. Arnold S. Jackson, Madison, Wis., Reducing the Mortality of Perforated Appendicitis; Acute Surgical Conditions of the Abdomen.
- Dr. Winchell McK. Craig, Rochester, Minn., Role of the Protruded Intervertebral Disk in the Production of Low Back and Sciatic Pain; Reaction of the Central Nervous System to Trauma: Diagnosis and Treatment.
- Dr. Norman F. Miller, Ann Arbor, Mich., The Human Cervix in Health and Disease; The Bloody Complications of Obstetrics.
- Dr. Guy A. Caldwell, New Orleans, Sulfanilamide in Compound Fractures; Treatment of Fractures of the Upper Extremity of the Humerus.
- Dr. Rosco G. Leland, Chicago, Director, Bureau of Medical Economics, American Medical Association, Medicine Prepares; Current Social Experiments in Medicine.
- Dr. Alexis F. Hartmann, St. Louis, Management of Severe Diarrheal Acidosis and the Alkalosis of Vomiting; Treatment of Upper Respiratory Tract Infections.
- Dr. Clarence M. Hyland, Los Angeles, Convalescent Human Serum Therapy; Serum and Plasma as Blood Substitutes.
- Dr. James G. Carr, Chicago, Clinical Diagnosis of Coronary Occlusion; Cardiac Irregularities and Paroxysmal Tachycardia.
- Dr. J. Peerman Nesselrod, Evanston, Ill., Anal Infections; Proctoscopic Cinematography.

The medical societies of Colorado, Montana, New Mexico, Utah and Wyoming form the Rocky Mountain Medical Conference. This year the Wyoming State Medical Society will be host to the conference.

MIDWAY ISLANDS

Midway Islands Physicians Organize Society.—Physicians and dentists stationed with the Third Defense Battalion, Fleet Marine Force, and others with civilian contractors in defense construction on the Midway Islands in the North Pacific Ocean have organized the Midway Islands Medical-Dental Society with Dr. Khatchig H. Terts as president and Lieut. (j. g.) William R. Franklin, D. C., U. S. Navy, as secretary. The society plans to hold monthly meetings when ships calling at the islands bring visiting physicians and dentists. The first meeting was held on June 12 with the following program:

- Lieut. Comdr. Julian Love, M.C., U. S. Navy, Early Diagnosis of Thromboangiitis Obliterans; also Tetanus Toxoid.
- Lieut. Franklin and Lieut. (j. g.) Ralph W. Geise, M.C., U. S. Navy, Ludwig's Angina (case report).
- Lieut. Comdr. Roy F. Cantrell, M.C., U. S. Navy, Thrombophlebitis; also Meningococcal Meningitis.

PHILIPPINE ISLANDS

Association Approves School Administration.—The Philippine Medical Association at its recent annual meeting adopted a resolution commending Dr. Antonio Sison, dean of the College of Medicine, University of the Philippines, on his administration of the college. An editorial in *The Journal of the Philippine Medical Association* points out that in the four years since Dr. Sison was appointed dean the faculty has been strengthened, limitation and rigid selection of students have been enforced, research and scholarship on the part of the faculty have been encouraged, the curriculum has been simplified, methods of teaching have been modernized and conferences have been instituted for improvement in the work of students and faculty.

GENERAL

Society News.—The twenty-sixth National Recreation Congress will be held in Baltimore, September 29-October 3, at the Lord Baltimore Hotel. This year's program will include discussion of recreation for men in military service and recreation as a factor in civilian defense.—The Polish Medical and Dental Association of America will meet in Grand Rapids, Mich., August 21-23, in a combined meeting with the Polish-American National Bar Association and the National Federation of Polish Art Clubs.—The annual meeting of the International Association of Milk Sanitarians will be held in Tulsa, Okla., October 27-29. The president is Mr. Leslie C. Frank, U. S. Public Health Service, Washington, D. C., and Mr. C. Sidney Lee, New York State Department of Health, Albany, is secretary.

Air Hygiene Foundation Changes Name.—The Air Hygiene Foundation of America, Inc., has changed its name to the Industrial Hygiene Foundation of America, Inc., to

descrihe more clearly the expanding activities and services of the organization, it is announced. When the foundation was organized in 1935 its main emphasis was on silicosis. With the rapid advances in industrial hygiene and with new occupational health problems, the work has steadily broadened. A study is now under way in collaboration with the U. S. Public Health Service to help reduce sick absenteeism in heavy industries. Other studies include roentgen ray technics for large scale physical examinations in industry, control of toxic fumes and gases, exhaust ventilation for health protection of employees and investigations of "protector" dusts to combat dust diseases.

Prevalence of Poliomyelitis.—The U. S. Public Health Service reported on July 18 that 187 cases of poliomyelitis had been reported for the week ended July 12, as compared with 82 cases for the preceding week. The highest incidence was in the South Atlantic and East South Central states, which reported 127 cases. In the first twenty-eight weeks of this year a total of 983 cases had been reported in the country as a whole, as compared with 948 for the same period in 1940. Newspaper reports indicate that 69 cases have been reported for the year up to August 2 in Illinois. The number of cases current in Tennessee on August 2 was said to be 53. These are centered in Coffee, Franklin, Bedford and Davidson counties. New York City has had only 17 cases from January 1 up to July 30; the first death occurred during the week ended July 30, according to the *New York Times*. Reports dated July 16 gave 70 cases as the total for Alabama since June 1 and 131 for Georgia between June 1 and July 15.

Provisional Mortality Figures for 1940.—The steady decline in the mortality rate in recent years appears to have been checked in 1940, the Bureau of the Census reports in its announcement of crude death rates based on provisional mortality statistics for 1940. According to these tabulations there were 1,417,257 deaths in 1940, an increase of 29,460. The rate was 10.8 per thousand, compared with 10.6, the final rate for 1939. The rate appears to have been higher in thirty states and the District of Columbia, lower in thirteen states and the same in five states. The largest increase was reported for Nevada and the largest decrease for New Mexico. The highest rates were: District of Columbia 13, Vermont 12.8, New Hampshire 12.7, Nevada 12.7, Maine 12.5, Delaware 12.2, Maryland 12.1 and Florida 12.1. The lowest rates were: North Dakota 8.2, South Dakota 8.5, Wyoming 8.5, Oklahoma 8.8, Arkansas 8.8 and Utah 8.9 per thousand of enumerated population. Cities with the highest rates were: Sacramento, Calif., 16.5; New Orleans 16.4; Nashville, Tenn., 16.2; Tacoma, Wash., 16, and Albany, N. Y., 15.

Grants for Infantile Paralysis Research.—The National Foundation for Infantile Paralysis announced new grants totaling \$195,030, July 25. Among the larger grants are the following:

University of Michigan School of Public Health, Ann Arbor, \$40,000 to provide facilities for the study of virus diseases.

National Organization for Public Health Nursing, New York, two grants totaling \$23,400 to encourage nurses to study orthopedic public health nursing, to aid in developing centers for such study and to prepare a manual on orthopedic care.

Children's Hospital, Boston, \$6,300 to finance continued study of effects of infantile paralysis on the growth of the lower extremities and a new study of the effect of prolonged bed rest on development of calcoli in the urinary tract of patients.

Strong Memorial Hospital, Rochester, N. Y., \$9,200 to continue studies to determine functional indexes in normal and abnormal locomotion.

Michael Reese Hospital, Chicago, \$7,930 to permit continuation of previous studies in various aspects of the treatment of infantile paralysis and some aspects of the after-effects of the disease.

Johns Hopkins University School of Medicine, Baltimore, \$9,300 for studies of antibodies neutralizing the infantile paralysis virus.

City Hospital, Cleveland, \$5,300 for a study of infantile paralysis in experimental animals.

New York State Health Department, Albany, \$12,000 to study the prevalence of apparently healthy carriers.

Physical Therapy Meetings.—The American Congress of Physical Therapy and the American Occupational Therapy Association will hold their annual meetings at the Hotel Mayflower, Washington, D. C., September 1-5. Among speakers at the physical therapy meeting will be:

Dr. Walter S. McClellan, Saratoga Springs, N. Y., The Role of Spas in Medical Preparedness.

Howard A. Carter, B.S. in M.E., secretary, Council on Physical Therapy, American Medical Association, Chicago, Threshold of Electrical Stimulation.

William F. Wells, B.S., Philadelphia, Radiant Disinfection of Air.

Dr. Fred B. Moor, Los Angeles, Hydrotherapy in Local Injuries and Infections.

Dr. Lewis Clark Wagner, New York, Evaluation of Operative Procedures in Spastic Paralysis.

Dr. Edmund Jacobson, Chicago, Cultivated Relaxation for the Elimination of Nervous Breakdowns.

Dr. Henry L. Williams, Rochester, Minn., Physical Treatment of Incurable Headache.

There will be one joint session of the two organizations with the following speakers, among others:

Dr. Winthrop M. Phelps, Baltimore, Correlation of Physical Therapy and Occupational Therapy in the Treatment of Cerebral Palsy.

Dr. Robert Lee Patterson Jr., New York, Obstetric Paralysis.

Dr. Alfred R. Shands Jr., Wilmington, Del., Operative Treatment of the Lower Extremity in Infantile Paralysis.

Dr. Robert L. Bennett Jr., Warm Springs, Ga., Adequate Home Treatment for the Patient with Poliomyelitis.

The occupational therapy program announces sessions devoted to children with heart disease, neuropsychiatric aspects of occupational therapy, tuberculosis, methods used in the facilities of the Veterans Administration and national defense. Dr. Nathan H. Polner, New Orleans, is president of the American Congress of Physical Therapy and Mr. Everett S. Elwood, Philadelphia, of the American Occupational Therapy Association.

FOREIGN

British Students to North American Schools.—Twenty-six British medical students have been chosen to study in nineteen medical schools of the United States and Canada under the auspices of the Rockefeller Foundation, the *British Medical Journal* reports. Candidates were chosen by the deans of medical schools. Nearly a hundred applications were received and nearly two thirds of the number were interviewed by the committee of selection, headed by Sir John Stopford, Manchester.

Government Services

Dr. DeLien in New Assignment

Dr. Horace DeLien, special physician in tuberculosis control of the Indian Service for California, Nevada and Utah, with headquarters in San Francisco, has been made special expert in tuberculosis to succeed Dr. Joseph D. Aronson, who has been called to army duty. Dr. DeLien will continue studies in vaccination with BCG which were initiated by Dr. Aronson in North Dakota, South Dakota, Wyoming, Arizona and Alaska. In addition he will continue to supervise the control program in the states under his former assignment.

New Public Health Workers Assigned

The U. S. Public Health Service announces that forty-one physicians, thirty-nine nurses, fifty-one sanitary engineers and three laboratory technicians have recently been assigned to state and local health departments in defense areas to help in public health problems created by the emergency. These workers first spent a month at the National Institute of Health in Bethesda, Md., for orientation courses. Funds have been provided for the training of engineers for malaria control work. This training will be given at a field station in Norfolk, Va., in cooperation with the Virginia State Health Department.

Government Seeks Medical Personnel

The U. S. Civil Service Commission announces examinations for three types of medical positions. Junior medical officer positions at St. Elizabeths Hospital in Washington, D. C., at \$2,000 a year are to be filled, including rotating internships and psychiatric residencies. To qualify for the rotating internships, applicants must be fourth year students in recognized medical schools and must show completion of the course before June 30, 1942. Graduates in medicine who have already served a rotating internship are offered a postgraduate internship of one year of psychiatry. Applications will be accepted until November 15.

Medical technical assistant positions at \$2,000 a year and medical guard attendant positions at \$1,620 a year will be filled in the mental hygiene division of the U. S. Public Health Service. Applicants must be registered nurses or have been honorably discharged (within ten years preceding the examination) from the Medical Corps of the army or navy or must have had three years' service as guard attendant in a federal penal or correctional institution. Applicants for the positions of technical assistant must have had responsible training or experience in clinical laboratory technic, pharmacy or roentgen ray laboratory technic. Applications for these positions will be accepted until further notice. Information and application forms may be obtained at any first or second class post office or from the Civil Service Commission in Washington, D. C.

Foreign Letters

LONDON

(From Our Regular Correspondent)

June 21, 1941.

Health in War Time

In a previous letter (*THE JOURNAL*, Dec. 7, 1940, p. 2014) the minister of health, Mr. MacDonald, was quoted to the effect that the national health had actually improved under war conditions. The health statistics for 1939, in which there were eight months of uneasy peace and four months of war, were almost uniformly better than those of 1938, which in turn were an advance. Nearly a year and a half of war, on a scale which demands the greatest possible amount of the national energies, has elapsed since the period covered by Mr. MacDonald's survey, and a similar report can be made. All the sources of information available show that the nation has stood up remarkably well to war conditions. In the last few months of 1940 and the spring of 1941 there was an epidemic of influenza, which was attributed to an undetermined type of virus. But there were no serious cases. There was also early in 1940 an epidemic of rubella. This was relatively harmless. Otherwise, in spite of crowded air raid shelters and the domestic disorganization due to evacuation of children and others to safer areas, we have remained free from any major epidemic. In spite of prolonged hours of work and the withdrawal of most of the younger men for military service, industrial sick records do not show any great increase of illness.

So much for physical illness. It might be expected that the strain of this world war, with the new horror of the bombing of crowded cities, in which eighty thousand persons—almost all unarmed men, women and children—have been massacred or mutilated, would have had some mental effect on the population at large. But it preserves its characteristic calm and balance. There are of course some sufferers from shock among those exposed to the deafening explosion of bombs, of whom some have narrowly escaped death. But it has been found that the majority of these were already of the type liable to break down in any unexpected or severe emergency. The air raids have revealed rather than created them. No effect has been observed on the definitely insane or epileptic.

In spite of the dietetic restrictions, which limit the consumption of such important foods as meat (24 cents worth weekly), butter (4 ounces weekly), sugar (8 ounces weekly) and cheese (1 ounce weekly), the nutrition of the people remains excellent for the reason that so many other foods are not rationed. Indeed, Lord Horder has pointed out that for many elderly and sedentary persons the restrictions have probably been beneficial.

The position as regards tuberculosis—a disease very dependent on nutrition—is satisfactory. During the last fifty years there has been a continuous decline of this disease and at an accelerating rate. Thus the death rate from all forms in 1927 was 972 per million persons living; in 1937 it was 695. But during the last great war and for two years afterward the incidence increased. Since then there has been a steady and continuous improvement. Up to the present there has been no notable increase ascribable to the present war.

War Time Nurseries

The war has disturbed family life by evacuation from areas liable to bombing and by the increased employment of women in industry. The need has therefore arisen of making some form of nursery provision for young children. The government is now providing war time nurseries both for evacuated children and for women in employment. They are administered by a joint staff of the Ministry of Health and the Board of Educa-

tion, but the local authority is made responsible for their provision and the special war time arrangements. There are two types of nursery. The first type is the part time nursery, which provides for children between the ages of 2 and 5 years, is open approximately for school hours and is under the direction of a teacher. Such nurseries are suitable for children evacuated with or without their mothers and also for children whose mothers are either in part time employment or are able to make other arrangements for the care of their children before the nursery is opened in the morning and after it is closed in the evening.

The second type is the whole time nursery. This provides for the full day time care and maintenance of children up to the age of 5 years. It is required when women are in full time employment and cannot arrange for the care of their children at any time during the day. They are open for periods up to fifteen hours a day and provide meals and facilities for resting and bathing. A trained nursing staff is essential. The local education authority arranges for the social training and occupation of children between the ages of 2 and 5 years. At whole time nurseries, where children are cared for all day and receive all their meals, mothers pay 24 cents daily; at part time nurseries, where no meals are provided, 6 cents daily. But no payment is required from evacuated mothers who are not in employment. The American Red Cross has made a gift for the conditioning of huts and premises to serve as nurseries for evacuated children.

Soldiers Should Be Taught First Aid

A "Lance-Corporal" has made in the *Lancet* a suggestion so sensible that, following the shavian paradox, one could say "This is so obvious that it has been overlooked." The lance-corporal points out that the soldier is taught how to kill and destroy, how to operate his weapons and how to protect himself against similar weapons, but he does not receive lessons in how to save a comrade's life. The army books say that in the rear of our front we shall have regimental aid posts and behind them a temporary hospital. Therefore it is argued that all wounded shall receive prompt treatment. But recent experience in France showed that there is no such thing as a "front." Mechanized forces move too quickly for that, so that small bodies of men are isolated from the main body. It follows that every soldier should know how to set broken limbs, stop arterial bleeding and have a sound knowledge of first aid. When the lance-corporal mentioned the matter to his medical officer he was told "Bad first aid is often worse than no first aid." To this his answer is "Every soldier must know how to apply good first aid." Though medical officers are busy men, they would be only too pleased to give lectures.

The Protection of Patients Against Attacks of Poison Gas

The Ministry of Health is sending warnings to the public to be prepared for gas attacks. They should see that their respirators are kept in good order and always have them at hand. In hospitals special questions arise. For patients suffering from certain disabilities such as chronic asthma, heart disease or facial distortions, special respirators with outlet valves or helmet respirators are issued. It is suggested that the respirators be kept by the patients' beds where they will be ready for instant use. Soon after admission each patient who is in a suitable condition should try on his respirator to see that it fits properly. It may be possible to institute a weekly gas practice for the staff and for patients who are in a suitable condition.

Medical supplies, like food, should be protected against contamination with gas. The normal conditions of storage of medical and surgical supplies in warmed and ventilated build-

ings should provide all that is practicable of protection against liquid contamination. Some additional protection can be afforded by using existing stocks of waterproof sheeting, batiste, cellophane or other impermeable material as a covering for unprotected stores or for stores whose nature or wrapping do not themselves provide protection. Surgical dressings, cotton wool or bandages wrapped in paper, cardboard or cartons would not be contaminated by exposure to vapor, provided the wrappings are undamaged. Traces of vapor could be removed by opening them out and airing them for an hour or so in a clean, well ventilated atmosphere. If contaminated by liquid, it is doubtful whether any decontamination treatment would be satisfactory, and destruction by burning may be unavoidable. Gum elastic catheters, surgeons' gloves and fine rubber drain sheeting are unlikely to stand boiling and, if contaminated by liquid, should be destroyed. Metal instruments can be decontaminated by immersion for thirty minutes in boiling water or swabbing with a solvent.

NEWS FROM GERMANY

(Compiled from Recent German Periodicals)

Required Reports on Hospitalized Soldiers

Irregularities in notifying military authorities of the hospitalization, discharge or death of soldiers treated in public or private institutions and in failing to furnish the case histories and other necessary information regarding the legal status of such men has caused confusion in the military records and anxiety among relatives. It has happened that hospitalized men were recorded as absent without leave or classified among the missing. In order to forestall further irregularities, a number of regulations have been announced. Hereafter, civil hospitals are required promptly to report to the central military bureau in Berlin responsible for the nation's casualty records the admission, discharge or death of all hospitalized soldiers. Full case histories must be kept, including notations relative to the subsequent needs for care and possible claims on the part of the hospitalized men. When men are transferred to other hospitals, copies or summaries of their case histories must be sent along, together with roentgen film reproductions, if these are necessary or requested. On discharge for further military or naval service or in the event of death, copies of case histories and roentgenograms should be transmitted, on request, to the military or naval authority involved. Case histories originating during army or navy medical care should be returned in their original form. Original records may be temporarily released by public or private hospitals for photostatic purposes.

Louvain University Destroyed Again

The library of the University of Louvain has suffered what seems to amount to approximate annihilation. Damaged in the World War and rebuilt largely with the financial aid of American well wishers, it was again destroyed in May 1940. Of the 900,000 volumes only 15,000 survive, and of 800 manuscripts only 15. Three thousand collections of periodicals were completely destroyed by fire; likewise, 811 incunabula and 200 valuable engravings, including some by Dürer and Holbein, and the 22,606 photographs of all known Coptic manuscripts. (From the *Deutsche medizinische Wochenschrift* 67:577 [May 23] 1941.)

Venereal Disease Census

In June 1940 a census was taken throughout Germany of all venereally infected persons treated by a physician for the first time. One hundred and twenty-two thousand men and 73,000 women were so reported. This seems to indicate that the morbidity rate for venereal diseases during the present war did not increase, contrary to usual war time expectations. However, an increase in female cases of gonorrhea was reported. The increase is attributed to the use of more thorough methods of examination.

Enforced Change of Name of Evangelical Hospitals

The names of the following evangelical hospitals have been changed: Bethanien is now the Sophienkrankenhaus; Bethesda was changed to Elise Averdick; Bethlehem to Anshar; Ebenezzer to Albrechtkrankenhaus; Elim to Krankenhaus Hohe Weide; Jerusalem to Krankenhaus am Moorkamp; Tabea to Krankenhaus am Falkenstein (Blankenese), and Siloah becomes Albertinenkrankenhaus. In the Siloah hospitals for men and young women the name Siloah has likewise been replaced by Albertinen.

New Medical Periodical

The first issue of a new periodical, called *Vitamine und Hormone*, central organ of vitamin and endocrine research, was published in the spring of 1940. The periodical will present original articles and related scientific material. Publication will perhaps be on a monthly basis. The periodical is edited by Prof. B. C. P. Jansen of Amsterdam, Prof. A. Scheunert of Leipzig, Prof. H. Siebke of Bonn and Prof. W. Stepp of Munich.

Medical Care for the Underprivileged

Since the end of March of this year, social welfare clients in Vienna will no longer have to accept medical treatment from physicians of the poor (armenärzte) but are free to consult sick fund physicians (kassenärzte). A certificate good for the year is furnished them by the local welfare stations.

Marriages

JEAN McNUTT MARTIN, Middlebrook, Va., to Mr. Ralph Allen Glasgow of Roanoke in Brownsburg recently.

WILLIAM F. HUGHES JR., Indianapolis, to Miss Wanema Alter Dickey of Carlisle, Pa., in Baltimore, June 28.

RUSSELL W. BLANCHARD, Council Bluffs, Iowa, to Miss Muriel W. Alexander of Oglesby, Ill., in June.

WILLIAM SOUTHARD SCOTT, Spartanburg, S. C., to Miss Lucille Loggins of Dickson, Tenn., June 11.

JOHN ROBERT HILSENBECK, Jenkins, Ky., to Miss Florence Burns of Milligan College, Tenn., June 19.

WILLIAM KEEFER BRUMBACH, Belleville, N. J., to Miss Mattie Evelyn Boone of Edgefield, S. C., in June.

JAMES BARRETT THOMPSON, Rochester, N. Y., to Miss Elizabeth Allen in Ann Arbor, Mich., June 14.

JAMES BYRON CARTY, Burlington, N. J., to Miss Allie Brown Rendleman at Salisbury, N. C., June 14.

BENJAMIN HACKETT HARDING, Yadkinville, N. C., to Miss Eula Blanche Bare of Jefferson in June.

EDWARD VERNON POLLARD, Parsons, Tenn., to Miss Dorothy Templeton at Gulfport, Miss., June 7.

ISAAC C. KNOX JR., Vicksburg, Miss., to Miss Emmette Brown of Birmingham, Ala., in June.

ROBERT O. NORTHWAY to Miss Georgia Fay Kasischke, both of Mount Pleasant, Mich., June 21.

MYRON GORDON HOWLE, Summerton, S. C., to Miss Carolyn Giles Atrial of Greenville, June 12.

GEORGE K. HAMMERSLEY, Indianapolis, to Miss Mary Ellen Lemen of Osgood, Ind., May 16.

RICHARD DENMAN CROW, Shreveport, La., to Miss Mary Jane Eager of Jackson, Miss., June 5.

DENNIS S. MEGENHARDT, Indianapolis, to Miss Mary Virginia Kendall of Marion, Ind., May 25.

CORNELIUS A. SAFFERT, New Ulm, Minn., to Miss Helen M. Kienlen of St. George, May 26.

WINTER C. WALLACE to Miss Mildred Taylor, both of Ruthfordton, N. C., in June.

JOHN H. MOWRY to Miss Virginia A. Davenmy, both of Conneaut, Ohio, June 14.

RALPH G. NICHOLS to Miss Virginia Bruce, both of Knoxville, Tenn., June 21.

DUNCAN D. MONROE, Alton, Ill., to Miss Alberta Martin of Godfrey, June 1.

HARRY E. MURPHY to Miss Helen Catt, both of Franklin, Ind., June 1.

Deaths

William Herman Myers * Savannah, Ga.; University of Tennessee Medical Department, Nashville, 1901; member of the House of Delegates of the American Medical Association from 1929 to 1941; past president of the Medical Association of Georgia; fellow of the American College of Surgeons; at one time a first lieutenant in the medical reserve corps of the United States Army; served during the World War; on the staffs of the Telfair Hospital and St. Joseph's Hospital; aged 62; died, July 17, in Highland, N. C., of coronary thrombosis.

George Elihu Bellows, Laguna Beach, Calif.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1885; member of the Missouri State Medical Association and the American Academy of Ophthalmology and Otolaryngology; for many years chairman of the public health and welfare committee of the chamber of commerce of Kansas City, Mo.; at one time on the staffs of St. Luke's, St. Margaret's and the Research hospitals, Kansas City, Mo.; aged 79; died, June 19, of heart disease.

Allen J. Black * Major, United States Army, retired, Richmond, Va.; Medical College of Virginia, Richmond, 1884; veteran of the Spanish-American and World wars; entered the medical corps of the United States Army July 1, 1920 as a major and retired Jan. 27, 1928 for disability in line of duty; past president of the Roanoke Academy of Medicine; aged 76; died, June 25, of myocarditis and arteriosclerosis.

Robert Boyd Bogle, Nashville, Tenn.; University of Nashville Medical Department and Vanderbilt University School of Medicine, Nashville, 1894; also a dentist; past president of the American Dental Association; professor emeritus of clinical dental surgery at Vanderbilt University School of Medicine; dean of the Vanderbilt University School of Dentistry from 1919 to 1926; aged 66; died, May 25.

Burton Haseltine * Chicago; Hahnemann Medical College and Hospital, Chicago, 1896; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staff of the Henrotin Hospital; consulting otologic surgeon, Cook County Hospital and the Illinois Masonic Hospital; aged 66; died, July 12, of heart disease.

William George Bouse, Goff, Kan.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1906; member of the Kansas Medical Society; served during the World War; past president of the Nemaha County Medical Society; aged 65; was killed in June when the automobile in which he was driving was struck by a train.

Joseph T. Abshire * Kaplan, La.; College of Physicians and Surgeons, Baltimore, 1889; past president of the Vermillion Parish Medical Society; formerly member of the school board of Leroy and postmaster; for many years parish coroner and mayor of Kaplan; aged 72; died, June 22, of heart disease, arteriosclerosis and hypostatic pneumonia.

Charles Daniel Johnson * Tulsa, Okla.; St. Louis University School of Medicine, 1914; at one time head of the department of physics and chemistry at the Northwestern State Normal School, Alva; assistant in chemistry, 1914-1915, assistant in pathology, 1915-1916 and instructor in pathology, 1916-1917 at his alma mater; aged 59; died, June 24.

William Harrison Slaughter, Darien, Conn.; Columbia University College of Physicians and Surgeons, New York, 1907; health officer; on the associate staff of the Stamford (Conn.) Hospital and on the courtesy staff of the Norwalk (Conn.) Hospital; aged 62; died, June 4, of coronary thrombosis.

Carl Aticus Harris, Bessemer, Ala.; University of Alabama School of Medicine, Mobile, 1910; member of the Medical Association of the State of Alabama; fellow of the American College of Surgeons; served during the World War; on the staff of the Bessemer General Hospital; aged 54; died, June 22.

Nathaniel F. Cheever, Greenfield, N. H.; University of Vermont College of Medicine, Burlington, 1883; member of the New Hampshire Medical Society; past president of the Hillsboro County Medical Society; formerly member of the school board; aged 84; died, June 15, in Milford of arteriosclerosis.

Frederick M. Brooks, Fairfax Station, Va.; University of Pennsylvania Department of Medicine, Philadelphia, 1883; member of the Medical Society of Virginia; for many years bank president and member of the county school board; aged 82; died, June 21, of chronic myocarditis.

Martin Luther Hindley, Monroeville, Ohio; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1900; member of the Ohio State Medical Association; formerly a member of the board of education; aged 71; was found dead, June 25, of heart disease.

Everett Chaney Robbins, Chillicothe, Ohio; Ohio State University College of Medicine, Columbus, 1917; member of the Ohio State Medical Association; served during the World War; aged 48; died, June 4, in the Chillicothe Hospital of cerebral hemorrhage.

Waitman T. Willey Dye, Grantsville, W. Va.; Starling Medical College, Columbus, 1886; member of the West Virginia State Medical Association; aged 80; died, June 26, of rheumatic valvular heart disease and carcinoma of the stomach.

Howard Murray Ritter, Williamsport, Pa.; Jefferson Medical College of Philadelphia, 1895; member of the Medical Society of the State of Pennsylvania; fellow of the American College of Surgeons; aged 71; died, June 1, of heart disease.

Edward William Hanlon * San Francisco; College of Physicians and Surgeons, medical department of Columbia College, New York, 1893; on the staffs of St. Marys and St. Francis hospitals; aged 69; died, June 3, of coronary occlusion.

Frank Hollis Burnett, Brockton, Mass.; Dartmouth Medical School, Hanover, N. H., 1890; member of the Massachusetts Medical Society; on the staff of the Brockton Hospital; aged 74; died, June 21, of coronary thrombosis.

Frank Houston Gardner, Flat Rock, Ala.; College of Physicians and Surgeons, Baltimore, 1891; also a minister; aged 74; died, June 6, in Calhoun, Ga., of uremia, following injuries received in an automobile accident.

Thomas Earl Goyer, Jackson, Tenn.; Memphis Hospital Medical College, 1912; member of the Tennessee State Medical Association; aged 53; died, June 16, in the Memorial Hospital of hemorrhage due to gastric ulcer.

William Edgar Braswell, Sandy Ridge, N. C.; University of Georgia Medical Department, Augusta, 1907; formerly county coroner; aged 61; died, June 16, in a hospital at Winston-Salem of cerebral hemorrhage.

Vincent Pangolli Bell * Greenville, S. C.; Medical College of the State of South Carolina, Charleston, 1923; aged 53; died, June 12, in the Johns Hopkins Hospital, Baltimore, of cirrhosis of the liver.

James M. Sheppard, El Dorado, Ark.; Arkansas Industrial University Medical Department, Little Rock, 1897; member of the Arkansas Medical Society; aged 77; died, June 9, of myocarditis and nephritis.

Frederick William Youmans, Lewisville, Ark.; Rush Medical College, Chicago, 1891; member of the Arkansas Medical Society; aged 75; died, April 3, in the Josephine Hospital, Hope, of thrombosis.

Otis Fillmore Miller, Danville, Ky.; Southwestern Homeopathic Medical College and Hospital, Louisville, 1902; served during the World War; aged 76; died, June 9.

Robert Goldberg * New York; University and Bellevue Hospital Medical College, New York, 1914; aged 52; died, June 13, in the Park East Hospital of uremia.

Gustav Frederick Boehme Jr., Los Angeles; Cornell University Medical College, New York, 1910; aged 53; died, June 7, of an overdose of a drug, self administered.

Charles John Edgar, North Hatley, Que., Canada; McGill University Faculty of Medicine, Montreal, 1887; served during the World War; aged 78; died, June 18.

Frank Harris, Trenton, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1900; aged 64; died, June 24, in St. Francis Hospital.

Luis C. Boneta, Rio Piedras, P. R.; Baltimore Medical College, 1908; member of the Medical Association of Puerto Rico; aged 55; died in June.

Harry Amant, Springfield, Ill.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1910; aged 61; died, June 27, in St. John's Hospital.

William Clare Green, Little Rock, Ark.; University of Arkansas School of Medicine, Little Rock, 1905; aged 72; died, June 17.

Robert Bruce Burwell, Moose Jaw, Sask., Canada; University of Toronto Faculty of Medicine, 1905; aged 64; died, June 3.

Stanley Thomas Cavins, Stanford, Ill.; Baltimore Medical College, 1903; aged 67; died, June 21.

Bureau of Investigation

CEASE AND DESIST ORDERS

Abstracts of Certain Federal Trade Commission Releases

The work of the Federal Trade Commission, in helping to protect the public against misrepresentation or fraud in the medical as well as other fields, has been greatly extended by the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act. The Food, Drug and Cosmetic Act of 1938 added to the Food and Drug Administration's control of the advertising claims and statements made on the labels of medicine or on the carton or in the accompanying leaflet, whereas what might be termed collateral advertising, that which appears in newspapers and magazines and over the air, comes more actively under the purview of the Federal Trade Commission by virtue of the Wheeler-Lea Amendment.

THE JOURNAL has at various times commented on the activities of the Federal Trade Commission in this connection, even before the Wheeler-Lea Amendment gave it its added rights. In some cases the Commission may accept from the person or concern involved a stipulation that the objectionable practices or claims cited will be discontinued. In other cases the Commission issues what is known as a Cease and Desist Order, in which the individual or company cited is ordered to cease and desist from practices which have been declared objectionable. Abstracts of some of the orders issued during 1940 follow:

Atlas Short Wave Diathermy.—This was promoted by a Jacob L. Goldman, Los Angeles, alias J. L. Coleman, who traded as Atlas Health Appliance Company. On Dec. 12, 1940 the Federal Trade Commission issued a cease and desist order against Goldman to discontinue certain advertising misrepresentations. Among these were that his device or any other of substantially similar construction, when used by the unskilled lay public, constitutes a scientific, safe, harmless or effective means or method for the treatment of sinusitis, neuralgia and numerous other ailments, or that the mechanism aids in killing bacteria. Goldman also was to cease disseminating advertisements which failed to reveal that the unsupervised use of the device by persons not skilled in the diagnosis, analysis and methods of treatment of disease may result in serious and irreparable injury to health.

Beautiderm Midget.—This device, recommended for use in the electrolytic removal of hair, is put out by Electrolysis Associates, Inc., New York, who represented that it could be used at home for removing superfluous hair safely, painlessly and permanently. According to the findings of the Federal Trade Commission the use of this device by unskilled persons under conditions prescribed in the advertisements or under customary and usual conditions might result in serious or irreparable injury to health, such as local infections, erysipelas, skin burns, scarring and permanent disfigurement, and, moreover, the treatment would not be painless in untrained hands. On Dec. 16, 1940 the Commission ordered the Electrolysis Associates, Inc., and Louis Zinberg, an officer of the corporation, to discontinue the representations to which the Commission had objected. All of this in spite of the fact that in November 1938 Louis Zinberg, trading as Beautiderm Company, New York, had signed a stipulation with the Commission that he would cease advertising that his Beautiderm Midget would permanently destroy or prevent the regrowth of superfluous hair and could be self applied with absolute safety, unless in making such representations he would explain to the user that proper skill and care are necessary in employing the device. He also had promised to discontinue representing that the Beautiderm Midget constitutes the "one method advised by physicians as absolutely safe" so as to imply that they constitute the only so-called safe method of removing superfluous hair, when such is not a fact.

Blue Jay Foot Products.—On Dec. 7, 1940 the Federal Trade Commission reported that it had ordered the Kendall Company of Boston, which has a manufacturing division in Chicago under the trade name Bauer and Black, to cease and desist from certain misrepresentations in the advertising of its "Blue Jay Corn Plaster," "Blue Jay Bunions and Callus Plasters" and "Blue Jay Liquid Corn Remover." Among them were that corns have roots, that the Blue Jay products will prevent the formation or recurrence of corns or calluses, or that they constitute a new treatment for corns, calluses or bunions, or will instantly stop the pain caused by corns or calluses. The Commission declared that these representations were untrue and that the products cannot always be relied on entirely to remove the cornlike portions of corns which project into the dermis. Back in 1916 the late Dr. Harvey W. Wiley, former chief of the Food and Drugs Division at Washington, reported in his book "1001 Tests" that Blue Jay Corn Plaster contained salicylic acid, which, as he pointed out, "is practically always the active ingredient of corn salves."

Delv.—On Dec. 29, 1940 the Federal Trade Commission ordered Primrose House, Inc., New York, to discontinue certain misrepresentations in the sale of this product, such as that "Delv" acts on the skin as do the natural fluids of the skin or that it serves the same purpose as these fluids; that it will cause wrinkles, large or unsightly pores or other imperfections to disappear from the skin; that it will nourish or rejuvenate the skin or create a new skin texture, or will keep the face young and the complexion beautiful. Still earlier (May 1935) a subsidiary of the

concern, Primrose House Sales Company, Inc., had signed a stipulation with the Federal Trade Commission in which it agreed to abandon the use of certain allegedly false representations in the sale of Delv. The Federal Trade Commission reported, however, that in spite of this some of the misrepresentations had continued, and hence the necessity for the cease and desist order.

Kuhn's Remedy.—This product of the Kuhn Remedy Company, Chicago, was earlier known as "Kuhn's Rheumatic Remedy" and "Kuhn's Rheumatic Fever Remedy." On Dec. 5, 1940 the Federal Trade Commission ordered this concern to cease and desist from making certain misrepresentations in its advertising. Among these were that the product is a cure or remedy for rheumatism, rheumatic fever and similar ailments or that it possesses substantial curative value in the treatment of such conditions and that it is entirely safe and harmless. Back in 1919 another federal agency, the Food and Drug Administration, prosecuted the Kuhn concern for violating the original Food and Drugs Act in selling Kuhn's Rheumatic Remedy under false and fraudulent claims. Government chemists reported at that time that the nostrum was a solution of water and alcohol with potassium iodide, iodine and sugar, as well as indications of small amounts of plant material and aromatics.

Magie Shaving Powder.—This preparation, put out by the Morehouse Manufacturing Company, which traded as the Shaving Powder Company, Savannah, Ga., was advertised under various untenable claims. Among these were that "At last science has found a way to remove a beard without shaving," and readers were advised to "shave without a razor" and "merely apply Magie Shaving Powder as directed, then wipe off leaving a clear, smooth skin." The Federal Trade Commission's findings, however, were that the preparation does not constitute a new method and is not harmless in all cases, as two of the ingredients are barium sulfide and calcium hydroxide, which may be harmful to the skin and its underlying structures in persons who have tender skin, and its use may also result in injury to the eyes of careless users. On Dec. 19, 1940 the Commission ordered the Morehouse concern to cease representing that Magie Shaving Powder is a new method for removing hair or that the method prescribed for its use constitutes shaving. It also ordered the discontinuance of advertisements which fail to warn that this powder should not be used by those having a tender skin and should not be allowed to get into the eyes of users thereof.

Mayos Periodic Compound.—George D. Moorman and Roy C. Stoekbridge, trading as Mayos Products Company and M. P. Company, Chicago, were ordered by the Federal Trade Commission on July 6, 1940 to cease advertising that this nostrum is a cure, remedy or competent treatment for delayed or painful menstruation or that it is harmless. Also prohibited were any advertisements which fail to reveal that the use of the product may cause serious and irreparable injury to the health of the user.

Miller's "Reducer."—This was sold under three names, "Belite," "Reducers" and "Miller's Reducing Prescription," and put out by Julius and Jessie Miller, trading as Miller Drug Company, Rochester, N. Y. They represented it as a safe, competent and effective treatment for obesity, which the Federal Trade Commission found to be false and misleading as the product contained dried thyroid in quantities sufficient to cause serious and irreparable injury to the health if used under the conditions prescribed in the advertisements or under such conditions as are customary or usual. On Dec. 16, 1940 the Commission ordered the Millers to discontinue such misrepresentations.

Quinox Capsules.—These were put out by a William S. McClymonds, trading as Oxol Laboratories and Western Research Laboratories. The concern was ordered by the Federal Trade Commission on May 6, 1940 to cease representing its product falsely as an effective treatment, cure or remedy for delayed menstruation.

Retonga.—The Retonga Medicine Company, Atlanta, Ga., was ordered by the Federal Trade Commission on July 1, 1940 to discontinue certain misrepresentations in the sale of this product. Among these were that it is a cure or remedy for diseases or disorders characterized by such symptoms or conditions as nervousness, indigestion, headaches, sluggishness, pains, poisoning, dizziness, muscular aches and pains, insomnia, biliousness, undernourishment, loss of weight or lack of strength; that it possesses any value in the treatment of these symptoms and conditions in excess of the temporary relief furnished by a mild laxative or gastric tonic when such symptoms or conditions are due to or caused by constipation or lack of appetite, or that its preparation has therapeutic value in the treatment of constipation in excess of providing temporary relief. Further representations prohibited under the order are that "Retonga" relieves the body of toxic poisons or cleanses the system; that it has any beneficial effect or therapeutic value in the treatment of kidney or bladder disorders; that it renews or restores the strength or health or has any therapeutic properties with respect to building health or strength in excess of stimulating the appetite.

Reva.—Cecil D. Kitchin, trading as the Reva Company, Chicago, was ordered by the Federal Trade Commission on July 14, 1940 to cease representing that "Reva" is not a dye or that it is anything other than a dye; that it will supply a substitute for or replace natural pigment in the hair; will restore natural or youth-like color to the hair or have any effect in stimulating its growth; that it will act as a cure or remedy for dandruff, scalp eczema or falling hair or that it is safe or harmless in treating scalp disorders.

Scholl's Foot Products.—The Scholl Manufacturing Company, Inc., Chicago, has on several occasions run afoul of the Federal Trade Commission because of unwarranted claims that were made in the advertising of its products. On Dec. 8, 1940 the Commission ordered the Scholl concern to cease and desist from certain misrepresentations in the advertising of its "Zino-Pads" and "Kurtorex Foot Plasters." Among these were that the pads stop pain instantly or in one minute or make it possible to lift out corns or calluses after the application of the pads without the use of surgery or other aids; that these pads are a cure or remedy for corns, calluses or bunions, or have healing properties; that the use of the

Kurotex Foot Plasters instantly relieves the pain caused by corns, sore toes, calluses, bunions or tender spots on the feet resulting from new or tight shoes, or that they give any degree of relief from such condition beyond that which follows from the protection from outside pressure and friction or provide such relief at any time other than when they are being worn.

Sekov.—This anti-fat nostrum, also known as "Sekov Reducer," is put out by Edwin H. and Hazel Ruth Vokes, doing business as Sekov Corporation and Sekov Reducing Studios, Hollywood, Calif. On Sept. 26, 1940 the Federal Trade Commission ordered these persons and concerns to cease disseminating advertisements which failed to reveal that the use of Sekov under conditions prescribed in the advertising, or those customary or usual, may result in serious or irreparable injury to health. The findings were that the product is not, as represented, a scientific treatment for obesity when administered without a thorough medical examination and without scientific care and observation; that it does not guard the health of the user, act on a corrective principle or reduce by normalizing the body and that, contrary to such representations, the preparation does contain cathartics and dangerous drugs. The Commission further found that this nostrum constitutes a treatment for obesity only when used by persons suffering from hypothyroidism. Obesity, the findings continue, may be due to several causes, including the dysfunctioning of the pituitary gland, and to excess intake of food, in which cases the use of Sekov would be improper and ineffective. Further, the findings continue, the use of the preparation, although it may result in taking off fat by accelerating the rate of metabolism, may seriously weaken the body and its organs, including the heart, as the preparation contains a dangerous drug, an extract of thyroid.

Silver Label Formulas.—Two of these items, put out by Michael S. Chiodak, using the trade style "Tone Company," were "Silver Label Formula No. 6" and "Gold Label Formula No. 8," each known also as "Tone Periodic Compound" and sold as a remedy for delayed menstruation. On July 1, 1940 he was ordered by the Federal Trade Commission to cease circulating advertisements that failed to reveal that the use of his products may result in serious and irreparable injury to health.

Sorbol-Quadruple and Bukets.—These are put out by one Charles Keller, doing business as Sorbol Company and Keller Company, Mechanicsburg, Ohio. The city chemists of Cleveland stated years ago that they found "Sorbol-Quadruple" to be essentially soap and alcohol, with some potassium iodide. "Bukets" was once reported to contain, among other things, buchu leaves and juniper oil, common components of so-called kidney remedies. On Dec. 19, 1940 the Federal Trade Commission announced that it had ordered Keller to discontinue certain misrepresentations that had been made for these two nostrums. Among them were that Sorbol-Quadruple is a simple cure or remedy for goiter and possesses substantial therapeutic value in the treatment of that condition, and that the mixture is entirely safe and harmless; that Bukets is of any substantial value in eliminating excess acid or waste from the body, or constitutes a cure or remedy for frequent or scanty flow of urine, rheumatic pains, backache or leg pains, or possesses any substantial therapeutic value in the treatment of such conditions, or, in fact, any therapeutic value whatever in excess of its action as a mild diuretic. Keller also was ordered to discontinue any advertisements for Sorbol-Quadruple which fail to reveal that the stuff should not be used by those having tuberculosis or any form of goiter other than simple goiter (provided, however, that such advertisements need contain only a statement that the preparation should be used only as directed on the label thereof, when such label contains a warning to the effect that the preparation should not be used by those having tuberculosis or any form of goiter other than simple goiter). Still earlier (June 1937) Keller had signed a stipulation with the Federal Trade Commission agreeing to discontinue certain false and misleading representations in the sale of Bukets.

Super-Pure Laxative Bromide Quinine Tablets.—This is put out by the Spors Company of Le Center, Minn., which is run by a Frank Spors. He was ordered by the Federal Trade Commission on Oct. 17, 1940 to discontinue misrepresenting this product as a cure or remedy for colds. The Commission's findings were that it will not accomplish the results claimed, although it may afford a temporary relief for cold symptoms.

Van Vleck Nostrums.—The Dr. Van Vleck Company, Jackson, Mich., has for many years been selling by mail a combination treatment for hemorrhoids. This has included a "Dr. Van Vleck's Ointment," "Dr. Van Vleck's Mucro Cones" and "Dr. Van Vleck's Pills." On May 19, 1940 the Federal Trade Commission ordered the concern to cease representing in its advertising that this treatment comprises an effective and scientific cure for hemorrhoids and that it removes them without surgical aid and insures immediate and lasting relief with no return of suffering.

Wain's Compound.—This product is put out by Wain's Laboratory, Inc., of Hollywood, Calif. It was formerly known as "Ama-Gon." On Oct. 25, 1940 the Federal Trade Commission ordered the concern to cease representing that its nostrum has any therapeutic value in the treatment of bronchial asthma or bronchial coughs in excess of furnishing temporary symptomatic relief from the paroxysms of asthma and bronchial irritations or that the preparation is in all cases safe or harmless; and to discontinue any advertisement which fails to reveal that the preparation should not be used by those having tuberculosis or goiter; provided, however, that such advertisement need contain only a statement that the preparation should be used only as directed on the label thereof, when such label contains a warning to the effect that the preparation should not be used by those having tuberculosis or goiter. More than two years earlier, on July 4, 1938, the Commission had ordered Wain's Laboratory, Inc., to discontinue representing that its product is an effective remedy or treatment for asthma, hay fever or related bronchial ailments; that it is harmless, containing no habit-forming or heart-depressing drugs and that it is a new and startling discovery.

Correspondence

LOCAL APPLICATION OF SEX HORMONES

To the Editor:—Local application of sex hormones has been attempted in occidental medicine only during the last few years. In oriental therapy evidently it was well known for centuries. The novel "The Golden Lotus" (English translation by Clemens Egerton, without date, 4 volumes, George Routledge & Sons, London; German translation by Franz Kuhn under the title *Kin Ping Meh*, 1 volume, without date, Inselverlag, Leipzig), by Wang Shih-Cheng, who died in 1593, gives a vivid and realistic picture of Chinese life and customs at the time of the Sung dynasty in the reign of Hui Tsung 1100-1126, with numerous medical and diagnostic as well as therapeutic details. A Hindu monk reciprocates gifts from a wealthy pharmacist by presenting him with some aphrodisiac pills to be taken "one at each occasion, no more, with a drop of spirits," and a red powder to anoint the glans penis with the advice, "every time you use it, take 2 grains and no more. Should you feel a burning sensation, take your weapon in your hand and stroke your thighs a hundred times or so. Then all will be well." The German translation of this part is more detailed and says "a little box with a red ointment, a little more than one fifth of an ounce to anoint the glans penis, sufficient for one hundred and ten applications." This means 0.0515 Gm. for one application, which indicates that it is a rather potent drug. The monk describes the effect of the remedy: "What is the merit of this medicine? . . . New strength will be given to limbs and belly, it will refresh the testicles, invigorate the penis . . . in a hundred days, hair and beard will be black once more, in a thousand days, your body will know its power. Your teeth will be stronger, your eyes more bright, your manhood made rigid. . . ."

It is interesting that fastening and fixing of teeth as a sequelae of invigoration of the testicles was mentioned by Doppler when he published the results of his rejuvenation operation by chemical sympathectomy in 1925. This he did by painting the spermatic artery with a 5 per cent phenol solution in order to achieve a long-lasting dilatation of the artery and thus hyperemia of the testicle.

Biedl, who was in favor of Doppler's operation, recommended its use and acknowledged its beneficial effect on the gingiva and teeth and recommended consideration of these changes in general as a test for rejuvenation. Possibly the monk's red ointment contained some plant extract which duplicated the effect of androgens, just as ephedrine, the extract of the root *ma huang*, duplicates the action of epinephrine, the adrenal hormone. This drug was used by the Chinese for a long time before it found its entrance and acceptance in occidental therapy.

One more remedy of this type may be mentioned. At the beginning of the last third of the nineteenth century the sinologist Hirth brought the root *tang-kui* (or *kau-kiu*, *woen-wu*, *man-mo*, *shan-ki*) to Europe, an extract of which for four and a half thousand years had been used in China in the treatment of amenorrhea and dysmenorrhea. The German pharmaceutical firm Merck in Darmstadt produced a standardized extract of this root and introduced it under the trade name *Eumenol*. *Eumenol* was used for many years as an emmenagogue in central Europe. Favorable experiences were published by Mueller, Palm, Ziemann and Popoviciu. Probably in using this drug one is dealing with another plant extract which simulates the effect of an animal hormone. Several herbal extracts of this type evidently were known to the Chinese medical profession for centuries.

Of the true animal hormones known to the Chinese, Edward H. Hume, in his recently published "The Chinese Way in Medicine," mentions only epinephrine, which, as an analysis by Chen and Jensen showed, is contained in the Chinese drug

ch'an su, the dried venom of the Chinese toad, used externally for canker sores, sinusitis and, in general, for local inflammatory conditions.

Local application of sex hormones has been used in modern occidental medicine only in 3 instances. Jadassohn and his school provoked increase in the size of the breast of the guinea pig by local application of estrogenic substance, and similar experiments were carried out by Mussio-Fournier, Albricux and Buno, de Fremery, Lewis, Mixner and Turner. Cyril MacBryde (*THE JOURNAL*, March 18, 1939, p. 1045) treated women with infantile breasts by daily application of 5 grains (0.3 Gm.) of an ointment which contained estradiol or estradiol benzoate. Local application of theelin to the vagina proved an efficient therapy in gonorrhea of young girls (Lewis, Weinstein, Reichert, Epstein, Jung and Colwell) and local application to the vulva an efficient therapy in kraurosis (Foss, Buschbeck, Kaufmann).

Theoretical considerations seem to encourage the local application of sex hormones for sensitization of the organs which are the nervous receptors for sex stimulation, i. e. the glans of the penis and the clitoris. The sensitive nerves and their endings in these organs lie beneath the epithelium and are open to the sensitizing effect of the hormones, which may reach them in higher concentration when penetrating locally from the surface than when administered only by circulation of the blood. Several female patients whose clitoris was anointed two to three times a week for several weeks with estrogens showed slight enlargement of the clitoris, and women with frigidity had their normal sex desire restored. Male patients whose glans penis was treated by application of androgens recorded more frequent erections and greater persistence of erections. Clinical experiments are under way by Dr. W. M. Kearns of Milwaukee and by Dr. August F. Daro and Dr. Aaron Kanter of Chicago, and results will be published after completion.

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[NOTE.—Obviously the effects of psychologic and manual stimulation must be considered in evaluating these techniques.—En.]

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE
CHICAGO, Feb. 16-17, 1942. Council on Medical Education and Hospitals, Sec., Dr. William D. Cutter, 535 North Dearborn Street, Chicago.

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in *THE JOURNAL*, August 2, page 387.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, Sept. 10-12. Part III. Baltimore and New York City, October; Boston, November. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written*. Nov. 3. Final date for filing application is Sept. 23. *Oral*. Dec. 12-13. Final date for filing application is Nov. 8. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written*. Oct. 20. Final date for filing application is Sept. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written*. Part I. Group B. Various centers, Jan. 3. Final date for filing application is Oct. 6. *Oral*. Part II. Groups A and B. Atlantic City, May or June. Final date for filing application is March 1. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral*. Chicago, Oct. 18. *Written*. March 7, 1942. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Washington, January. Final date for filing application is Nov. 1. Sec., Dr. Guy A. Caldwell, 3503 Prytanis St., New Orleans, La.

AMERICAN BOARD OF PEDIATRICS: *Oral*. Philadelphia, March or April, at the time of the Region I meeting of the American Academy of

Pediatrics. Cleveland, May, at the time of the Region III meeting of the American Academy of Pediatrics. Los Angeles, May, at the time of the Region IV meeting of the American Academy of Pediatrics. *Written*. Locally, approximately 6 weeks in advance of the date of oral examination. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Oral*. New York, Dec. 19-20. Final date for filing application is Oct. 5. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N.W., Washington, D. C.

AMERICAN BOARD OF SURGERY: *Written*. Part I. Various centers, Oct. 6. Sec., Dr. J. Stewart Rodman, 225 S. Fifteenth St., Philadelphia.

AMERICAN BOARD OF UROLOGY: *Written*. Various centers, December. *Oral*. Chicago, February. Final date for filing application is Nov. 1. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Hospitals for Profit: Right of State Labor Relations Board to Require Collective Bargaining.—The New York State Labor Relations Board applied to the supreme court, special term, Kings County, N. Y., to confirm its determination against McChesney, the respondent, who owned and operated a private hospital conducted for profit, requiring him to bargain collectively with his hospital service and maintenance employees, who had chosen a certain local of the A. F. of L. as their collective bargaining agency. The respondent questioned the jurisdiction of the Labor Relations Board over him, his hospital and his hospital employees, largely on the ground that the intent of the New York legislature in enacting the state labor relations act, which created the Labor Relations Board and gave it specified powers to prevent stated unfair labor practices, was to control labor relations in industry. His apparent contention in this connection was that "industry" was used in the labor relations act in the sense of a "recognized business activity which employs much labor and capital and is a distinct branch of trade" and that the conduct of a hospital was not an "industry" in that sense of the term. The court, however, agreed with the position of the Labor Relations Board that under the Labor Relations Act it was given jurisdiction with respect to "labor conditions in any field of employment where the objective is the earning of a livelihood on one side and the gaining of a profit on the other."

As corroborative of its views concerning the applicability of the Labor Relations Act, the court referred to *Metropolitan Life Insurance Co. v. New York State Labor Relations Board*, 280 N. Y. 194, 20 N. E. (2d) 390, in which the New York Court of Appeals held that the act applied to insurance agents in the New York City area, rejected the argument that the application of the act was to be confined to employees as defined in article I of the labor law, which defined employee as "Mechanic, workman or laborer," and held that the act must be given a liberal construction to accomplish its purpose of fostering collective bargaining as between employer and employee.

Since the Labor Relations Board admitted that it had no jurisdiction over a "voluntary hospital" (apparently referring to a charitable hospital), the respondent argued that no distinction should be drawn in this respect against a hospital conducted for profit, since the functions of the two types of hospitals in the care of the sick "viewed in the sense of public need, are identical." But, answered the supreme court, judicial decision in this state has indicated a distinction between the two types of institutions. In *Jewish Hospital of Brooklyn v. John Doe*, 252 App. Div. 581, 300 N. Y. S. 1111 (J. A. M. A. 111:475 [July 30] 1938), the supreme court, appellate division, second department, in holding that a statute, which was declared to be in pari materia to the Labor Relations Act, limiting the right of state courts to issue injunctions in cases involving or growing out of labor disputes did not prohibit the issue of an injunction asked for by a charitable hospital, said:

We believe, even though the statute does not expressly exempt charitable corporations, that the Legislature never intended it to apply to an institution such as plaintiff [*Jewish Hospital of Brooklyn*]. While those involved in a labor dispute, as defined by the statute, need not stand in the relation of employer and employee, they must be engaged in the same "industry, trade, craft or occupation." These words connote and emphasize one common thought, to wit, that the parties to the controversy shall be engaged in the same business enterprise or commercial pursuit; one motivated by the desire for profit, the other by the desire

to earn a livelihood. . . . Obviously plaintiff is not engaged in any industry, trade, craft, or occupation for profit within the meaning of the statute.

The argument advanced by the respondent, continued the court, could be employed with equal force by a large milk corporation claiming that it performs the same function as a charitable organization devoted to the free distribution of milk. As further indicative of the correctness of this view that the Labor Relations Act applied to a private hospital conducted for profit, the court pointed out that the labor relations act specifically exempts from its provisions the employees of a charitable, educational or religious association or corporation. The court, accordingly, in effect, ordered the respondent to cease refusing to bargain collectively with the bargaining agency of his employees. On appeal to the supreme court, appellate division, second department, the order of the lower court was affirmed.—*State Labor Relations Board v. McChesney*, 27 N. Y. S. (2d) 866 (N. Y., 1940) 27 N. Y. S. (2d) 870 (N. Y., 1941).

Hospitals Not for Profit: Applicability of Minnesota State Labor Relations Act Requiring Collective Bargaining with Employees.—The Northwestern Hospital is a nonprofit, charitable corporation located in Minneapolis whose services are available to patients regardless of their ability to pay. Since the income received from pay patients is insufficient to cover its operating expenses for the continuance of its operations, it depends to a considerable extent on voluntary contributions from the public at large. In 1937 a few of its 125 maintenance and nonprofessional employees, such as janitors, laundrymen, firemen and elevator operators, were organized and joined a certain local union. Thereafter the union sought recognition as the bargaining agent of all maintenance and nonprofessional employees, and when the hospital refused to negotiate the union in May 1939 appealed to the state labor conciliator, who under the Minnesota State Labor Relations Act is given certain powers to prevent stated "unfair labor practices," included in which is a refusal to bargain collectively with employees. The conciliator, acting in pursuance to authority purportedly granted by that act, referred the dispute to the governor as one involving the public interest, and a commission representing labor, the hospital and the public was appointed. The commission reported in June 1939 that the hospital was subject to the State Labor Relations Act and the attorney general of the state concurred in that conclusion. The hospital still refused to negotiate. In February 1940 a "bannering" and picketing campaign was instituted, in the words of the court, "to inform the public that 'This hospital refuses to deal collectively with the union of its employees.'" Alleging that these acts caused unrest among its employees and generated nervousness among patients, who feared that windows would be smashed, heat and light turned off and visitors prevented from entering the hospital, the hospital sued to enjoin the union and others from picketing and "bannering." The trial court issued a temporary injunction which it later dissolved, and the hospital appealed to the Supreme Court of Minnesota.

The principal question to be determined, said the Supreme Court, is whether or not the hospital, by reason of the fact that it is a nonprofit, charitable corporation, is exempt from the provisions of the State Labor Relations Act. If it is, the action of the trial court in dissolving the injunction was erroneous. As indicative of the persons to whom the Labor Relations Act applies, the court quoted the definitions of "employer" and "employee" contained in the act, as follows:

"(b) 'Employer' includes all persons employing others . . . but does not include the state or any political or governmental subdivision thereof, nor any person subject to the Federal Railway Labor Act, . . .

"(c) 'Employee' includes, in addition to the accepted definition of the word, any employee whose work has ceased because of any unfair labor practice . . . but does not include any individual employed in agricultural labor or by his parent or spouse or in domestic service of any person at this own home." (3 Mason Minn. St. 1940 Supp., Sec. 4254-21.)

There can be no doubt, continued the Supreme Court, that both definitions are so comprehensive that they force the conclusion that a nonprofit, charitable corporation operating a hospital is within the act as one "employing others." Equally certain it is that one employed, for instance, as an elevator operator, as

a janitor or in a similar occupation is an "employee" within the accepted meaning of that term. It is to be noted that while the Labor Relations Act contains certain specific exemptions, there is no exemption in favor of charitable hospitals or of their employees. The most practical inference from this fact is that the legislature specified all the exemptions it intended and that since a hospital and its employees were not specifically excluded the legislature intended that the act apply to them. Furthermore, said the court, the hospital is not "the state or any political or governmental subdivision thereof," which is expressly excluded from the definition of "employer" already given. It is true that in *Jewish Hospital of Brooklyn v. Doe*, 252 App. Div. 581, 300 N. Y. S. 1111; and *Western Pennsylvania Hospital v. Lichter*, Ct. of Common Pleas, July 29, 1940 (Decision affirmed by the Supreme Court of Pennsylvania, 17 A. (2d) 206), the hospitals involved were held to be covered by a similar exclusionary clause contained in the definition of "employer" within the meaning of the labor relations acts of the states involved, but in both of those cases the hospitals involved received public funds for caring for patients to whom the particular governmental subdivision owed a duty to provide. Here the relation between the plaintiff hospital and the state is not sufficient to classify the hospital as an agency of the state.

The Supreme Court thought the intent of the legislature to make a hospital such as the plaintiff amenable to the Labor Relations Act was also clearly evidenced in that section of the act (Sec. 4254-27) that provides that—

"If the dispute is in any industry, business or institution affected with a public interest, which includes, but is not restricted to, any industry, business or institution engaged in supplying the necessities of life, safety, or health, so that a temporary suspension of its operation would endanger the life, safety, health or well-being of a substantial number of people of any community," the labor conciliator shall notify the Governor, who may appoint a commission of three to conduct a hearing and make a report.

It will be noted, said the Supreme Court, that in this provision, in addition to the inclusion of industry and business, an "institution" is specifically incorporated. Obviously the reference cannot be to a state institution since such an institution is exempted from the act, because, as previously noted, "the state or any political subdivision thereof" is specifically excluded from the definition of an "employer" subject to the act. The word "institution" then, as here used, must be taken in its ordinary sense. A hospital such as the plaintiff hospital is generally regarded as an institution in the community. It is not a business or industry but it is concerned with the well-being of the people. The intention of the legislature is more evident when consideration is given to the provision relating to the suspension of activity being a peril to a substantial number of people. It seems apparent that just such a situation as is now before us was contemplated by this statute. There is a clear recognition that hospitals are within the act.

While it is true, continued the court, that ordinarily labor legislation has been concerned principally with industrial labor relations, to place such a restricted meaning on the Labor Relations Act would amount to judicial legislation instead of interpretation. The employer-employee problem is more far reaching and to impute to the legislature a purpose to provide means for the adjustment of labor relations in industry only would be artificial. The duties of thousands of hospital employees are similar to those of employees in private industry. The position and rights of employees in a hospital are as important to the well-being of the whole community as those of technical industrial employees. The simple fact is that employees are dependent on their positions for livelihood. This is true whether the employer is a charitable hospital or an automobile manufacturer. The Labor Relations Act does not make the right to bargain collectively dependent on the nature of the employer's operation. Since the act is clear and unambiguous, there is nothing for us to construe. While it is true that the preamble of the Labor Relations Act reads: "An act relating to the avoidance and settlement of labor disputes and the promotion of industrial peace . . ." the fact is that the enactment itself goes beyond "industrial peace" but deals with "labor disputes" in institutions concerned with health and safety of a substantial number of people.

In view of the clarity of the statute, the court refused to give weight to the New York and Pennsylvania decisions referred to in which nonprofit, charitable hospitals were held not to be within the labor relations acts of those states. The court accordingly affirmed the action of the lower court in dismissing the injunction restraining the defendants from picketing or "bannering." In a special concurring decision, Stone, Justice, while agreeing in the result reached by the court, could not "agree in any implication there may be in this opinion or elsewhere that the maintenance and nonprofessional employees of a general hospital are not engaged in 'industry' within the meaning of the applicable statutes."—*Northwestern Hospital, Minneapolis, Minn., v. Public Building Service Employees' Union Local No. 113*, 294 N. W. 215 (Minn., 1940).

Hospitals Not for Profit: Pennsylvania State Labor Relations Act Requiring Collective Bargaining with Employees Not Applicable.—The twenty-five hospitals concerned in the present action are all nonprofit, charitable institutions. Twenty-one of them rendered in 1938 free services to the indigent at a cost of \$2,390,000 for which they received state contributions amounting to \$665,000. The difference was "made up from charitable contributions. For the fiscal year ending May 31, 1939, excluding one hospital, there was an operating deficit for the plaintiff hospitals of \$464,000, and of the twenty-five hospitals involved only six failed to show deficits."

The defendant union attempted to unionize the maintenance and nonprofessional employees of these hospitals and made certain demands, but the hospitals refused to negotiate with the union. The union then filed a petition with the Pennsylvania Labor Relations Board, which under the Pennsylvania State Labor Relations Act is given certain powers to prevent stated "unfair labor practices," included among which is a refusal to bargain collectively with employees. The hospitals filed a bill in equity with the court of common pleas, Dauphin County, Pa., to enjoin the board from proceeding against them under the Labor Relations Act and to enjoin the union from asserting rights against them purportedly granted by the act. The bill alleged that the hospitals concerned were not within the purview of the Labor Relations Act because (1) the provisions of the Labor Relations Act apply only to labor disputes in industry, commerce, trade, business or production and they are not engaged in such activities and (2) in performing the services they do they are performing a governmental function and governmental agencies are expressly exempted from the provisions of the act. The trial court issued a preliminary injunction without a hearing and the Labor Relations Board and the union appealed to the Supreme Court of Pennsylvania, which affirmed the action of the trial court and adopted its opinion.

The first question presented was whether or not the trial court had jurisdiction to issue an injunction without a hearing. The Pennsylvania Labor Anti-Injunction Act provides, in part, that in a case involving a labor dispute a court shall not have the authority to issue a preliminary injunction without affording a hearing to both the plaintiff and the defendant. Section 3 (a) of that act (1937, P. L. 1198; 1939 P. L. 302) provides that:

A case shall be held to involve or to grow out of a labor dispute when the case involves persons who are engaged in a single industry, trade, craft, or occupation.

A hospital, said the court, is not an industry. Neither are the employees of a hospital engaged in a single trade, craft or occupation. The employees of a hospital may have a common employer but they have no single trade, craft or occupation. Giving the words "industry, trade, craft or occupation" their commonly accepted meaning, we feel that they do not include the operations of a hospital. Even though the words of the statute are interpreted as broad enough to include the operations of a hospital, we do not think that the legislature intended such a result. The purpose of the act is to preserve the status quo during labor disputes, to insure the right to bargain collectively and to give to employees the right to choose representatives for this purpose. To show the scope of the act, the legislature attempted to define cases which "involve or . . . grow out of a labor dispute." In doing so, it used the words "industry, trade, craft or occupation." It has not been the custom in the past to unionize hospitals. The effect of unionization and attendant efforts to enforce demands would involve results far

more sweeping and drastic than mere property rights. The question of profits for the employer or wages for the employee are not alone involved. It is not merely a matter of suspending operations, ceasing work and stopping production, such as might be true in a steel mill or automobile factory. It is a question of protecting the health, safety and, in many cases, the very lives of those persons who need the service a hospital is organized to render. The results are quite different and more extensive than are those involved in an ordinary labor dispute. We cannot conceive that the legislature intended to include hospitals within the purview of the act. Consequently, even though the words used might conceivably be broad enough to include a hospital, nevertheless, a hospital is not within the spirit of the act and, not being within the spirit, the act does not apply to it. As authority for the last statement the court quoted from the opinion of the United States Supreme Court in *Holy Trinity Church v. United States*, 143 U. S. 457, 12 S. Ct. 511, as follows:

It is a familiar rule that a thing may be within the letter of the statute and yet not within the statute, because not within its spirit nor within the intention of its makers. This has been often asserted, and the Reports are full of cases illustrating its application. This is not the substitution of the will of the judge for that of the legislator; for frequently words of general meaning are used in a statute, words broad enough to include an act in question, and yet a consideration of the whole legislation, or of the circumstances surrounding its enactment, or of the absurd results which follow from giving such broad meaning to the words, makes it unreasonable to believe that the legislator intended to include the particular act.

We are convinced, continued the court, not only that the labor anti-injunction act has no application to a hospital but also that the effects of holding to the contrary would be so dangerous, disastrous and absurd as not to be within the intent of the legislature. The court accordingly held that nothing in the Labor Anti-Injunction Act legally deprived the trial court of the power to issue the preliminary injunction before the hearing.

The next question before the court was whether or not there was anything in the Pennsylvania Labor Relations Act which deprived the court of the power to issue the preliminary injunction. The Labor Relations Act was designed "to protect the right of employees to organize and bargain collectively." A labor relations board was created to carry out the provisions of the act. Within the scope of its authority this board initially exercises certain powers. With these the courts have nothing to do until resort is had to them for aid in enforcing orders, or in cases of appeal. But the present question is whether the plaintiff hospitals are employers within the meaning of the Labor Relations Act. The court again adverted to the *Holy Trinity Church* case, supra. In that an act of Congress was involved which made it unlawful to prepay the transportation of any alien into the United States under any contract or agreement made previous to migration to perform service of any kind in the United States. The church made a contract with an alien preacher to serve as its pastor. The act was held not to apply to those circumstances, the Supreme Court conceding that while the literal reading of the statute included the contract of the alien preacher, the statute was never intended to apply to such a case. Hospitals, said the court, are scientific institutions created for a humane purpose in amelioration of the sufferings of mankind. They require for their successful operation highly skilled physicians, surgeons, technicians, experts and nurses. They likewise require the services of other persons, some of whom may be skilled and some unskilled. But the whole must be coordinated, controlled and uninterrupted to accomplish the general purpose. This would be impossible should the Labor Relations Act be held applicable with all its attending ramifications, interruptions and possible cessation of service due to labor disputes and attending financial inability to function. Surely the legislature had no such intention, and we cannot so find in the absence of a clear and positive declaration to that effect.

As additional grounds for its holding the court referred to the fact that the word "employer," as defined in the Labor Relations Act, excludes the commonwealth or any political subdivision thereof. Of course, said the court, the plaintiff hospitals are not political subdivisions of the commonwealth. They are, however, with few exceptions, agencies selected by the commonwealth as a means of assisting in some degree the

indigent sick, disabled, injured or afflicted. Should the state choose to operate general hospitals, as it does certain mental hospitals, no one would claim that it was not performing a function of government and in so doing is not an employer within the meaning of the Labor Relations Act. Since the state chooses to perform this function through agencies supported in part by state appropriations, these agencies are likewise beyond the scope of the act. Were this not so, the appropriations might be diverted from their intended purpose to aid the indigent sick and injured to the payment of wages and increased operating costs. We think it obvious and indisputable that hospitals of this character are impressed with a public interest which takes them out of the purview of the act.

It was accordingly concluded that the trial court had the power to grant the preliminary injunction. Subsequently on June 9 and 11, 1941, the trial court issued a permanent injunction against the defendants perpetually restraining them and their successors, in the case of the defendant Labor Relations Board, from asserting any jurisdiction under the Labor Relations Act with respect to the plaintiff hospitals and, in the case of the union defendants, from asserting any rights against these hospitals under that act.—*Western Pennsylvania Hospital et al. v. Lichtler*, 17 A. (2d) 206 (Penna., 1941).

Workmen's Compensation Acts: Medical Testimony that Cerebral Thrombosis Possibly Resulted from Infected Thumb Not Sufficient for Award.—In the course of his employment, April 9, Burton, a man aged 61, in good health and with no observable "material hardening of arteries," ran a sliver in his left thumb. An infection developed and he went to a physician about a week later. In the opinion of the physician, the infection was localized, "did not go into his system" and, although serious so far as the function of the thumb was concerned, was not serious so far as his system was concerned. The thumb healed "perfectly well" but "continued to be more tender than the other thumb," owing to scar tissue and the recent inflammation. Toward the end of May the physician was called in to attend Burton and found that he had difficulty in walking, "had been a bit confused, was unable to get about his house without some help and was in a weakened condition." The patient was taken to a hospital where he died three weeks later of cerebral thrombosis. Attributing a causal relation between the industrial accident and the death, Burton's widow instituted proceedings under the workmen's compensation act of Vermont and was awarded compensation by the commissioner of industrial relations. The employer and his insurance carrier appealed to the Supreme Court of Vermont, Windham.

At the hearing before the commissioner, the only medical evidence tending to indicate a causal relation between the industrial accident and the thrombosis was the testimony of the attending physician that in his opinion the infection could have been a possible contributing cause of the thrombosis. This, the employer and his insurance carrier contended, was not legally sufficient to support the finding that the injury to the thumb resulted in death. Where, said the Supreme Court of Vermont, the evidence adduced in any particular case is such that any layman of average intelligence would know, from his own knowledge and experience, that the injuries involved in that case are the cause of death, expert evidence is not necessary to establish the causal relationship between the injury and the death. But where, as here, the physical processes terminating in death are obscure and abstruse and concerning which a layman can have no well founded knowledge and can do no more than indulge in mere speculation, without expert medical testimony the trier cannot properly find a causal relation. In this case, the mere fact that the infection in Burton's thumb resulting from the sliver could have been a possible contributing cause of his death does not alone warrant a finding that it was. There must be created in the mind of the trier something more than a possibility, suspicion or surmise that such was the cause, and the inference from the facts proved must be at least the more probable hypothesis, with reference to the possibility of other hypotheses. The commissioner recognized that the cause of death was obscure, that expert medical testimony could alone lay a foundation for his award and that the testimony of the physician that the infection from the sliver could have been

a possible contributing cause of death, without more, was not enough to support an award. But by taking into consideration all the evidence, not only the expert testimony but also all the circumstances of the case as shown by the evidence, he concluded that he was justified in finding that the sliver was the cause of death. Since expert evidence that an accident can or cannot cause a certain result may affect the conclusion to be reached, it follows that in the case of injuries so naturally and directly connected with the accident that proof of causation does not depend on expert evidence, medical testimony of "possibility" may corroborate the other testimony. But unless the facts, outside such medical testimony, fairly warrant the conclusion that the injury resulted from the accident, causation is not established. A possible cause cannot be accepted as the operating cause unless the evidence excludes all other causes or shows something in direct connection with the occurrence.

The widow claimed that medical evidence of "possibility" is sufficient to lay the medical foundation necessary to justify a finding of causal relationship when considered with the other evidence of a lay nature. The court then discussed three Massachusetts cases which were cited in support of this proposition. These cases, the court concluded, announced a proposition that medical evidence of "possibility" may make an otherwise insufficient proof of causation sufficient. Except on such a theory, said the court, the commissioner's conclusion cannot be sustained. However, we cannot endorse such a proposition where the evidence does not bar all other causes. Unless the other evidence fairly warrants a finding of causation or excludes all other causes, a conclusion based on medical evidence of "possibility" would be entirely speculative. Here we are simply told that the infection in the thumb could possibly have caused the cerebral thrombosis, which was the immediate cause of death. There is no testimony as to what cerebral thrombosis consists of, or what causes it or if it has any relationship to hardening of the arteries. In spite of Burton's good health so soon before his death, a layman of average intelligence, from his own knowledge and experience, could have no well grounded knowledge that the sliver was the cause of death. Although the sliver might have caused the fatal illness, the trier could only speculate as to whether it did or not.

For the reasons stated, the court annulled and set aside the order of the commissioner awarding compensation.—*Burton v. Holden & Martin Lumber Co.*, 20 A. (2d) 99 (Vt., 1941).

Society Proceedings

COMING MEETINGS

- American Association for the Study of Neoplastic Diseases, Washington, D. C., Sept. 4-6. Dr. Eugene R. Whitmore, 2139 Wyoming Ave. N.W., Washington, D. C., Secretary.
- American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Hot Springs, Va., Sept. 11-13. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.
- American Association of Railway Surgeons, Chicago, Sept. 8-10. Dr. Daniel B. Moss, 547 West Jackson Blvd., Chicago, Secretary.
- American Congress of Physical Therapy, Washington, D. C., Sept. 1-5. Dr. Richard Kovacs, 2 East 88th St., New York, Secretary.
- American Hospital Association, Atlantic City, N. J., Sept. 15-19. Dr. Bert W. Caldwell, 18 East Division St., Chicago, Executive Secretary.
- American Roentgen Ray Society, Cincinnati, Sept. 23-26. Dr. Carleton B. Peirce, Royal Victoria Hospital, Montreal, Canada, Secretary.
- Colorado State Medical Society, Estes Park, Sept. 17-20. Mr. Harvey T. Sethman, 537 Republic Bldg., Denver, Executive Secretary.
- Indiana State Medical Association, Indianapolis, Sept. 23-25. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.
- Kentucky State Medical Association, Louisville, Sept. 29-Oct. 3. Dr. Arthur T. McCormack, 620 South Third St., Louisville, Secretary.
- Michigan State Medical Society, Grand Rapids, Sept. 16-18. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing, Secretary.
- Mississippi Valley Medical Society, Cedar Rapids, Iowa, Oct. 1-3. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.
- National Medical Association, Chicago, Aug. 18-22. Dr. John T. Givens, 1108 Church St., Norfolk, Va., General Secretary.
- Nevada State Medical Association, Elko, Sept. 26-27. Dr. Horace J. Brown, P. O. Box 698, Reno, Secretary.
- Northern Minnesota Medical Association, St. Cloud, Aug. 15-16. Dr. Clarence Jacobson, Chisholm, Secretary.
- Oregon State Medical Society, Portland, Sept. 3-6. Dr. M. L. Bridgeman, 1020 S. W. Taylor St., Portland, Secretary.
- Rocky Mountain Medical Conference, Yellowstone Park, Wyo., Sept. 2-4. Mr. W. H. Tibbals, 616 McIntyre Bldg., Salt Lake City, Secretary.
- Washington State Medical Association, Seattle, Aug. 24-26. Dr. Vernon W. Spickard, 1305 Fourth Ave., Seattle, Secretary.
- Wisconsin State Medical Society of Madison, Sept. 10-12. Mr. G. E. Larson, 110 East Main St., Madison, Assistant Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery 10:353-396 (May) 1941

- Hypert thyroidism in Elderly Patients. D. H. Poer, Atlanta, Ga.—p. 353.
Nutritional Deficiencies as Public Health Problem in Alabama. J. N. Baker, Montgomery.—p. 358.
Surgical Management of Goiter. J. D. Wilson, Birmingham.—p. 363.
Some Ailments Peculiar to Infancy and Childhood: Their Cause and Prevention. J. C. Johnson, Hamilton.—p. 365.
Treatment of Common Proctologic Conditions. N. L. Andrews, Birmingham.—p. 368.
Burck Vaginal Operation for Sterilization. C. Johnson, Montgomery.—p. 370.

American Heart Journal, St. Louis

21:545-688 (May) 1941

- Prophylaxis Against Lethal Effect of High Altitude by Means of Digitalis Glycoside (Gitalin). E. Fischer, Richmond, Va.—p. 545.
Low Voltage of QRS Waves in Electrocardiogram, with Especial Reference to Lead IV. C. E. Leach, W. C. Reed and P. D. White, Boston.—p. 551.
Continuous Vasodilatation in Extremities Produced Reflexly: Physiologic Studies on Temperature of Skin and on Volume Flow of Blood. G. E. Brown Jr. and E. V. Allen, Rochester, Minn.—p. 564.
Auriculoventricular Ratio and Its Relationship to Electrical Axis of Heart. A. H. Clagett Jr., Providence, R. I.—p. 574.
*Livedo Reticularis: Peripheral Arteriolar Disease. N. W. Barker, E. A. Hines Jr. and W. M. Craig, Rochester, Minn.—p. 592.
Observations on Pathologic Effects of Thiocyanate: Experimental Study. H. A. Lindberg, M. H. Wald and M. H. Barker, Chicago.—p. 605.
Quantitative Changes in Capillary-Muscle Relationship in Human Hearts During Normal Growth and Hypertrophy. J. T. Roberts and J. T. Wear, with technical assistance of Irene Boten, Cleveland.—p. 617.
*“Anoxemia Test” in Diagnosis of Coronary Insufficiency. R. L. Levy, N. E. Williams, H. G. Bruenn and H. A. Carr, New York.—p. 634.
Experimental Atherosclerosis: III. Electrocardiographic Studies and Pathologic Changes in Hearts of Cholesterol-Fed Rabbits. Jan Nyboer, M. Bruger and S. M. Rabson, New York.—p. 657.
New Clamp for Gradual Occlusion of Coronary Arteries. K. R. Phelps, Cleveland.—p. 664.

Livedo Reticularis.—Barker and his collaborators report 13 cases of livedo reticularis or peripheral vascular disease. All the patients presented a persistent bluish red mottling of the skin of legs and feet. The mottling extended to the thighs in a few; it involved hands and arms to a less degree, and occasionally the lower part of the trunk. The livedo became more noticeable on exposure to cold, and there was a persistently lowered cutaneous temperature. The age at onset varied from 21 to 47 years. There was no evidence of syphilis, tuberculosis, tuberculids, occlusive disease of the larger arteries, varicose veins or venous insufficiency. Three patients had recurring ulceration of the skin of the legs. This, they stated, began as an intensification of an area of bluish discoloration. The ulcers of 2 were resistant to treatment and all were extremely painful. In the patient with the most extensive ulceration, occlusion of the arteries of each great toe developed on separate occasions. Three patients had a peculiar type of gangrene of the skin of the toes which persisted for several weeks or months and involved the distal half of the toes. In each instance the skin ultimately became black and hard and finally sloughed with healing except in 1, for whom amputation became necessary because of nonhealing and severe pain. A common etiologic factor could not be demonstrated. The clinical manifestations differed distinctly from Raynaud's disease, acrocyanosis or thromboangiitis obliterans. The available data indicate that in livedo reticularis there are usually organic changes in the arterioles of the skin, with chronic vasospasm, which result in

regional atony and dilatation of capillaries and slowing of the blood flow. Lumbar sympathetic ganglionectomy performed in two cases definitely improved the circulation and prevented further attacks of gangrene. It was unsuccessful in 1. Sympathectomy seems a justifiable procedure when no definite etiologic factor can be found and superficial gangrene is present.

Anoxemia Test.—Levy and his co-workers performed 326 anoxemia tests on 115 normal persons and 147 patients with suspected or manifest heart disease. During the course of the tests 2,316 electrocardiograms were made. In normal persons the electrocardiographic changes during anoxemia are relatively slight. Usually the amplitude of T waves in all of the four leads is lowered, and the T wave in leads 2 and 3 may be inverted. The established criteria for an abnormal response are sufficiently rigid to exclude alterations in the electrocardiogram resulting from emotion or other spontaneous variables. The test was positive in 18 per cent of 33 patients with suspected coronary sclerosis, in 31 per cent of 22 patients with coronary sclerosis but no history of anginal attacks, in 55 per cent of 73 patients with coronary sclerosis and a history of anginal attacks and in 5 per cent of 19 patients with hypertension without coronary sclerosis. The highest incidence of positive tests occurred among 49 patients with anginal pain caused by coronary sclerosis; an abnormal response was obtained in 69 per cent. There was no relationship between the incidence of positive tests, the size of the heart and the degree of pain during anoxemia. There was no constant effect on pulse rate and blood pressure. Seventeen patients experienced twenty-four reactions: vasovagal attacks, convulsions, hyperventilation, dyspnea and mental confusion. None of them were serious or harmful. There were 9 deaths at varying intervals after the test. A negative test does not rule out the possibility of early coronary lesions or healed cardiac infarction. The test when positive is a sign of coronary insufficiency and indicates a diminished coronary reserve. It has proved of value in distinguishing pain of coronary origin from that due to other causes. It gives a graphic record of the efficiency of coronary circulation at varying intervals following coronary occlusion. The effect of various drugs on the coronary circulation can be determined. It is suggested that it may be used to measure the effectiveness of establishing collaterals in the coronary bed following surgical operations designed to promote their formation. It may prove useful when disability is claimed because of anginal pain and in insurance examinations when coronary sclerosis is suspected. Only a positive result should be regarded as significant.

American Journal of Diseases of Children, Chicago

61:915-1130 (May) 1941

- Evolution of Hemiplegias in Infancy. R. K. Byers, Boston.—p. 915.
Vascular Anomalies of Spinal Cord in Children. D. N. Buchanan and A. E. Walker, Chicago.—p. 928.
Development of Fetal Lung, with Special Reference to Lining of Alveoli and Effect of Immaturity on Respiration. R. F. Norris, Philadelphia; T. T. Kochenderfer, Norristown, Pa., and R. M. Tyson, Philadelphia.—p. 933.
Effect of Pubertas Praecox on Age at Which Onset of Walking Occurs. W. Dennis, University, Va.—p. 951.
Hyperbilirubinemia in the Newborn. L. T. Davidson, Katharine K. Merritt and A. A. Weech, New York.—p. 958.
Phosphorus Retention in Children with Chronic Renal Insufficiency: Effect of Diet and of Ingestion of Aluminum Hydroxide. S. Freeman and Willie Mae Clifton Freeman, Chicago.—p. 981.
*Character of Congestive Failure in Children with Active Rheumatic Fever. B. J. Walsh, Washington, D. C., and H. B. Sprague, Boston.—p. 1003.
*Hypertension Associated with Unilateral Chronic Atrophic Pyelonephritis: Occurrence in Child in Whom No Decrease of Blood Pressure Followed Nephrectomy. B. Benjamin and M. Ratner, Montreal, Canada.—p. 1051.

Rheumatic Fever and Congestive Failure.—Walsh and Sprague describe clinical features of congestive failure in children with rheumatic heart disease. Their observations are based on a study of 44 children from 3 to 15 years of age seen at the House of the Good Samaritan between July 1937 and April 1940. The initial signs of heart failure were enlargement of the liver and puffiness of the face accompanied by an unexpected gain in weight. A few children with congestive failure and active rheumatic fever preferred to lie flat in bed. These

children had pronounced puffiness of the face, which caused them to look as if they had primary renal disease. Pulmonary rales were seldom heard; their appearance was limited to the terminal stages of the illness. Other important evidences were high venous pressure apparent at the onset of the failure, a shift of the electrical axis of the heart to the right, which increased with progression of the heart failure and decreased or disappeared with the patient's improvement or recovery, and a well defined diastolic gallop rhythm along the upper left sternal border.

Hypertension and Atrophic Pyelonephritis.—Benjamin and Ratner present the case of a boy of 6 with hypertension associated with pronounced atrophic pyelonephritis and severe functional impairment of one kidney but with no evidence of any other abnormality. He was subjected to a nephrectomy, after which there was no decline of the systolic or the diastolic blood pressures immediately and for the following six months. The principal pathologic features consisted of extensive fibrosis, decided diminution of the normal renal tissue and thickening of the arterioles in the fibrotic regions, a picture similar to that of unilateral chronic pyelonephritis associated with elevated blood pressure which decreases after nephrectomy. The relation between hypertension and renal disease requires further elucidation. At present it appears impossible to formulate definite criteria for selecting cases of unilateral nephropathy and hypertension in which a reduction in blood pressure may be expected to follow nephrectomy. A urologic examination is indicated in any child with chronic hypertension associated with renal disease. If such an examination demonstrates the presence of a unilateral renal lesion and operation is not contraindicated, nephrectomy may be justified. The hypertension may disappear after the operation, but that such a result may not follow should also be borne in mind.

American Journal of Ophthalmology, Cincinnati

24:485-610 (May) 1941

- Fifty Years' Experience in Ocular Motility: Part I. W. B. Lancaster, Boston.—p. 485.
Orbital Tumors and Their Surgical Treatment: Part II. A. B. Reese, New York.—p. 497.
Monocular Diplopia: Report of Case. M. H. Pincus, Brooklyn.—p. 503.
Scotoma Associated with Menstruation. J. N. Evans, Brooklyn.—p. 507.
Removal of Lens in High Myopia in Which Lenticular Opacities Prevent Improvement of Vision by Correcting Lenses. B. Chancc, Philadelphia.—p. 519.
Exophthalmos in Hyperthyroidism. D. Kravitz and W. V. Moehle, Brooklyn.—p. 527.
Retinal Teletraumatism: Traumatic Retinal Angiopathy (Purtscher). J. W. Smith, New York.—p. 537.
Preservation of Convergence with Paralysis of All Lateral Movements in Case of Intramedullary Tumor of Pons. W. S. Reese and J. C. Yaskin, Philadelphia.—p. 544.

American Journal of Physiology, Baltimore

133:1-188 (May) 1941. Partial Index

- Part Played by Carotid Body Reflexes in Respiratory Response of Dog to Anoxemia With and Without Simultaneous Hypercapnia. P. R. Dumke, C. F. Schmidt and H. P. Chiodi, Philadelphia.—p. 1.
Effect of Vasoconstrictor Substances in Shed Blood on Perfused Organs. R. J. Bing, with assistance of B. Gallardo, New York.—p. 21.
Nutritional Value of Some Common Carbohydrates, Fats and Proteins Studied in Rats by Single Food Choice Method. C. P. Richter, Baltimore.—p. 29.
Lymph Drainage of Gallbladder Together with Observations on Composition of Liver Lymph. Jane D. McCarrell, Sylvia Thayer and C. K. Drinker, Boston.—p. 79.
Concentration of Ascorbic Acid and Phosphatases in Secretions of Male Genital Tract. O. C. Berg, C. Huggins and C. V. Hodges, Chicago.—p. 82.
Study of Gaseous Exchange Between Circulatory System and Lungs. N. Underwood and J. T. Diaz, Nashville, Tenn.—p. 88.
Seasonal and Postural Changes in Blood Volume Determined by Carbon Monoxide Method, Employing Differential Electric Photometer for Estimation of Low Percentage Saturations of Hemoglobin with Carbon Monoxide. M. E. Maxfield, H. C. Bazett and C. C. Chambers, Philadelphia.—p. 128.
Papaverine Hydrochloride and Ventricular Fibrillation. E. Lindner and L. N. Katz, Chicago.—p. 155.
Effects of Training and of Gelatin on Certain Factors Which Limit Muscular Work. S. Robinson and P. M. Harmon, with technical assistance of E. S. Turrell and F. O. Mackel, Bloomington, Ind.—p. 161.
Effects of Carbon Monoxide Anoxemia on Flow and Composition of Cervical Lymph. F. W. Maurer, Boston.—p. 170.
Effects of Anoxemia Due to Carbon Monoxide and Low Oxygen on Cerebrospinal Fluid Pressure. F. W. Maurer, Boston.—p. 180.

American Journal of Public Health, New York

31:421-544 (May) 1941. Partial Index

- Appraising Public Medical Services. L. S. Reed and D. A. Clark, Washington, D. C.—p. 421.
Need for Greater State Supervision of Water Works. I. W. Mendelsohn, Washington, D. C.—p. 440.
Disabling Sickness Among Industrial Workers, with Particular Reference to Time Changes in Duration. W. M. Gafaer, Washington, D. C.—p. 443.
Use of Culture Method in Clinical Management of Gonorrhea. G. Sewell, Emilie Clarke and E. Nelson, Detroit.—p. 457.
Place of Maternal and Child Health Services in Generalized Program in a Health Unit. W. J. French, Annapolis, Md.—p. 465.
A County Health Unit with Proper Functioning Maternal and Child Health Program. I. Dyer, Tahlequah, Okla.—p. 471.
Medical and Dental Services for Dependent Children Under Public and Private Child Caring Agencies. L. C. Cole, Cleveland.—p. 477.
Proposed Method for Bacteriologic Examination of Flat Surfaces. W. G. Walter and G. J. Hucker, Geneva, N. Y.—p. 487.
Enforcement of Dishwashing: Regulations Applying to Eating and Drinking Establishments. W. von D. Tiedeman, Albany, N. Y.—p. 491.
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American Journal of Surgery, New York

52:197-394 (May) 1941

- *Conservatism in Gastric Surgery: New Technic for Resection. J. L. De Courcy, Cincinnati.—p. 200.
Distribution of Anesthesia Following Block of Sacral Nerves. G. E. Burford, New York, and L. A. Watkins, Leavenworth, Kan.—p. 206.
Analysis of 151 Cases of Intussusception from Charity Hospital of Louisiana at New Orleans. H. R. Kahle, New Orleans.—p. 215.
*Reduced Temperatures in Surgery: I. Surgery of Limbs. F. M. Allen, New York.—p. 225.
Open Surgical Reduction of Fracture Dislocation of Lumbar Spine with Cord or Cauda Equina Involvement. C. G. Barber, Cleveland.—p. 238.
Papillary Systendocarcinoma of Ovary. F. H. Jones, Long Beach, Calif.—p. 246.
Total Hysterectomy: Vaginal or Abdominal? H. Burwig, Buffalo.—p. 260.
Meckel's Diverticulum: Report of Two Cases. H. A. Conrad, Elkins, W. Va.—p. 267.
Obstruction of Sigmoid Flexure by Large Gallstone. J. A. Cahill Jr., Washington, D. C.—p. 285.
Carcinoma of Ampulla of Vater: Three Cases of Transduodenal Resection. L. River, R. W. McNealy and A. B. Ragins, Chicago.—p. 289.
Causalgia Backache. O. C. Hudson, C. A. Hettesheimer and P. A. Robin, Hempstead, N. Y.—p. 297.
Factors in Etiology of Chronic Noncalculous Cholecystitis. M. J. Brown, Davenport, Iowa.—p. 304.
Use of Stilbestrol in Menopause and Other Conditions. L. Kurzrok, C. S. Birnberg and H. Weber, Brooklyn.—p. 311.
Diverticula of Stomach. H. W. Schmidt and W. Walters, Rochester, Minn.—p. 315.
Bursa and Ganglion. J. H. Cherry and R. K. Ghormley, Rochester, Minn.—p. 319.

Conservatism in Gastric Surgery.—De Courcy operated on patients with gastric and duodenal ulcers and cancer in two stages in an effort to reduce the mortality. The procedure has been followed in his clinic for the last few years. For pyloric ulcer a gastroenterostomy was done first and was followed several weeks later by resection of the ulcerative area. By this method it has been found possible, if necessary, to do a high posterior gastroenterostomy on doubtful or poor risk patients and to improve their general physical condition. Usually within a short time they were able to withstand the actual removal of the ulcerous or cancerous area, which would probably have proved fatal if it had been undertaken at the outset. The two stage operation thus offers an excellent chance of success in cases in which the more radical procedures would not be feasible. By doing this operation when the disease is still in a relatively early stage, the patient's strength is conserved and he is fitted for the strain of the actual resection. The mortality has been reduced to less than 10 per cent. It has been the experience at the clinic that patients with ulcer need psychologic as well as physical supervision. The importance of the mental as opposed to the physical disturbance which the sufferer from gastric lesions endures is nearly equal to the physical handicaps. The author does not regard the two stage procedure as universally applicable. Its advantages, especially in carcinoma of the pylorus, are that it obviates retraction of the esophagus and that there is much less danger of contamination when the preliminary gastroenterostomy is employed. In ulcer cases there is always the possibility that resection may be avoided altogether, as the ulcer will sometimes heal when the irritation of the passage of material impregnated

with digestive juices is eliminated. The author believes that his technic of stomach resection presents less likelihood of immediate and remote complications. He begins the resection at the upper or proximal portion of the stomach, so that the area to be excised is removed from above downward. This makes it possible to visualize the posterior gastric wall while the resection is being made. The proximal portion of the gastric wall is covered with a heated pad and the distal end is raised, permitting the clamping and division of the gastrocolic and gastrohepatic omentums. If adhesions are present on the posterior wall of the stomach, they are divided as far down as the attachment of the pancreas to the duodenum. At this point the attachment to the duodenum is easily stripped off as far as necessary. The duodenal arteries are divided and ligated, and the duodenum is divided in the usual manner. Anastomosis is then performed between the jejunum and the stomach. The method, the author believes, has the advantages of speed, accuracy and simplicity. In his hands it has proved preferable to the older methods.

Reduced Temperatures in Surgery.—The modification of local metabolism by temperature, according to Allen, enormously influences the survival from a few hours or even minutes at elevated temperatures to fifty-four hours at a temperature near freezing. Both primary and secondary shock are abolished by suitably low temperature. For amputations and other procedures the patient sits up with the leg immersed in ice water about 1 inch above the tourniquet. Weaker patients are allowed to lie with their heads slightly elevated and the leg or thigh placed on a layer of ice and covered completely with cracked ice. From 2 to 5 teaspoons of salt is added to the ice in each bag. Temperatures, taken by occasionally inserting an ordinary laboratory thermometer between the ice bags and the skin, around 41 F. assure adequate chilling and safety against actual freezing. For an emaciated shin one hour may suffice for through and through anesthesia, or as long as five hours may be required for a rather thick thigh. If the sciatic nerve cannot be cut at mid thigh without attracting the patient's notice and with no change in pulse or blood pressure, something has been wrong in the preparation. The duration and extent of dissection are immaterial; all that matters is the condition left after completion. Shock is nonexistent except for the slight degree which may develop from tissue injury remaining after the wound is closed and the temperature is raised, allowing protoplasm to resume its functions. The limb is removed from ice bags in the operating room, is sterilized and the operation completed as usual. If solutions are to be used for sponging or other purposes they should be iced. For any particularly long operation the limb may be kept on a bed of ice bags. The cooler the operating room the better. The tourniquet is released when the wound is ready for closure. Circulation returns promptly, and bleeding points can be caught and ligated. The anesthesia continues long enough for convenient suturing. The guiding principle of postoperative care is to reduce the temperature to whatever extent may be necessary, but to raise it as fast and as far as may be safe. In cases in which there is an adequate blood supply there is no objection to letting the temperature of the stump return immediately to normal. Temperature regulation makes it possible to reduce tissue metabolism in the operated part to a level for which the existing blood supply is adequate and to maintain it at such a level until the circulation improves. The danger period of postoperative shock from damaged tissue can be bridged by temperature control. Refrigeration is applicable to conditions not handicapped by senility and arteriosclerosis, to war wounds and to industrial accidents. A large number of military and industrial wounds consist in mutilations of limbs, and to these the results of animal experiments are applicable. In warm weather ice is often available or can be specially provided. In cold weather only precautions against actual freezing are needed. Efficient chilling prevents the shock resulting from the tourniquet needed to stop hemorrhage. It also wards off local gangrene when the tourniquet is retained for a long time. The transportation of wounded persons is painless as far as limb injuries are concerned. Strength and resistance are probably better preserved than with intensive sedation. The wounded arrive at hospitals ready for immediate operation without any additional anesthetic.

Appropriate precautions against shock should be taken if a tourniquet has been in place for eighteen hours or longer. When any parts are potentially infected, refrigeration holds everything in abeyance. Bacteria cannot grow or invade. Suitable post-operative temperature reductions should facilitate conservative and reparative operations and aid in avoiding amputations and crippling. Allen concludes that the chief difficulty will perhaps consist in persuading surgeons that a refrigerated limb, no matter how cadaveric, actually retains vitality. The most revolutionary achievements of the method may be hoped for in military and emergency surgery. Refrigeration introduces the fundamentally new concept of anesthesia of protoplasm.

Anesthesiology, New York

2:245-368 (May) 1941

- Certain Physiologic Principles Underlying Resuscitation and Oxygen Therapy. A. R. Behnke, Washington, D. C.—p. 245.
Effect of Cyclopropane on Blood Pressure, Stroke Volume and Heart Size of Dog. D. E. Brace, D. Scherf and L. J. Spire, New York.—p. 261.
Experimental Study of Effects of Respiratory Stimulants in Animals Under Pentothal Sodium Anesthesia. L. H. Mousel and H. E. Essex, Rochester, Minn.—p. 272.
Grading of Patients for Surgical Procedures. M. Saklad, Providence, R. I.—p. 281.
Vinethene: Recent Laboratory and Clinical Evaluation. S. J. Martin and E. A. Rovenstine, New York.—p. 285.
Theory of Anesthesia Based on Protoplasmic Behavior. W. Seifriz, Philadelphia.—p. 300.
Nitrous Oxide Anesthesia for Thoracoplasty. S. C. Cullen, W. O. McQuiston and V. W. Petersen, Iowa City.—p. 310.
New Laryngoscope. R. A. Miller, San Antonio, Texas.—p. 317.
Adaptation of Continuous Nitrous Oxide to "To and Fro" Carbon Dioxide Absorption Technic. S. S. Lyons, New York.—p. 321.
Histopathologic Changes in Rats Following Administration of Pentothal Sodium and Sulfanilamide. P. H. Lorhan, Gretchen Guernsey and M. Harless, Kansas City, Kan.—p. 326.
Nausea and Vomiting During Spinal Anesthesia, Especially as Influenced by Preoperative Narcotics. Priscilla Sellman, Boston.—p. 333.

Annals of Surgery, Philadelphia

113:641-880 (May) 1941. Partial Index

- Story of Plastic Surgery. J. S. Davis, Baltimore.—p. 641.
Blood and Blood Substitutes in Treatment and Prevention of Shock, with Particular Reference to Their Uses in Warfare. A. Blalock and M. F. Mason, Nashville, Tenn.—p. 657.
Peripheral Vascular Injuries. I. A. Bigger, Richmond, Va.—p. 677.
Urogenital Injuries. P. G. Smith, Cincinnati.—p. 685.
Injuries to Chest. D. C. Elkin and M. H. Harris, Atlanta, Ga.—p. 688.
Role of Plastic Surgeon in Care of War Injuries. V. P. Blair, St. Louis.—p. 697.
New Developments in Treatment of Compound Fractures. G. A. Caldwell, New Orleans.—p. 705.
War Wounds of Nervous System. C. C. Coleman, Richmond, Va.—p. 712.
Abdominal Injuries: Preventive and Prophylactic Aspects. A. H. Storck, New Orleans.—p. 720.
Aids in Avoiding Serious Complications in Thyroidectomy. F. H. Lahey, Boston.—p. 730.
*Precautions in Treatment of Thyrotoxicosis. W. H. Cole, Chicago.—p. 752.
*Endocrine Studies of Patients After Subtotal Hypophysectomy. P. Starr and L. Davis, Chicago.—p. 778.
*Acute Cholecystitis with Perforation into Peritoneal Cavity. C. R. Edwards, W. H. Gerwig and W. L. Guyton, Baltimore.—p. 824.
End Results in Repair of Inguinal Hernia by Fascia to Fascia Rectus Sheath Closure. W. L. Estes Jr., Bethlehem, Pa.—p. 838.
Management of Bilateral Renal Stones: Point of View of the General Surgeon. J. G. Sherrill and D. P. Hall, Louisville, Ky.—p. 851.
Surgical Treatment of Arthritis. F. D. Dickson, Kansas City, Mo.—p. 869.

Treatment of Thyrotoxicosis.—Cole suggests that fixed rules of treatment do not apply in thyrotoxicosis because the toxicity can be definitely measured by clinical and laboratory methods and the treatment varied accordingly. Since the advent of iodine in the preoperative care of thyrotoxicosis few instances of postoperative crisis are observed. If a crisis develops an error has been made in the date or extent of operation. In spite of all precautions there will be a small mortality rate, perhaps as high as 0.02 or 0.03 per cent, because of unpreventable accidents. The incidence of natural death alone during several days of hospitalization will prevent the establishment of a mortality rate of zero, except by coincidence, in a large series of cases. Occasionally complications may develop which are in reality secondary to the operation but which appear unpreventable. The probability that the higher

mortality rates in the South over those in the North are related to the higher incidence of Negroes in the thyrotoxic patients is not clearcut. In the author's series of 478 thyroidectomies for toxic goiter, performed during the last four and a half years, there were no deaths among the 42 Negro patients. It is possible that the Northern Negro is better nourished than the Southern Negro. It would appear that longer preoperative therapy would be indicated and that weight gain must be greater than in the average patient. Of 6 patients dying following operation, 2 died because of crisis, 1 because of gas gangrene of the buttocks, 1 because of postoperative hemorrhage, 1 because of tetany and 1 because of acute hepatitis. All of these deaths were of white women. At least half of them were preventable, particularly the 2 patients in crisis and the 1 patient dying from postoperative hemorrhage. Neither of the 2 patients dying from crisis fulfilled the prerequisites as set forth by the author: gain in weight, basal metabolic rate below 50, a resting pulse of less than 110 and a response to iodine treatment. If these prerequisites cannot be met, operation should be postponed and a remission awaited or the patient submitted to removal of only one lobe. The 2 cases should be classified as errors in the choice of time of operation. The patient who died from hemorrhage into the neck could probably have been saved by more careful postoperative observation with opening of the wound and evacuation of the clot. The total operations were performed by twelve different surgeons. Hepatic insufficiency is a contributing cause of death in many instances. However, Foss and his associates were unable to find a direct relationship of the amount of hepatic damage to the severity of the crisis in patients dying of thyroid disease.

Endocrine Studies After Subtotal Hypophysectomy.—Starr and Davis determined the endocrine function of patients who have had subtotal hypophysectomies with the intention of giving substitution therapy to the patients who have had non-functioning tumors of the hypophysis and of ascertaining the necessity for further depressant therapy for those having hyper-functioning pituitary adenomas. Eighteen of the 25 patients studied had hypopituitarism, the others hyperpituitarism. The 18 patients exhibited hypopituitarism before operation, occasionally with cerebral damage accompanying the visual disturbance. The hypopituitarism continued after the operation; the nervous disorder of some was improved but in others it was increased; the visual loss was usually arrested or relieved, but blindness developed in some patients a few years after operation. Of the 7 patients with hyperpituitarism, none have had postoperative hypopituitarism; 3 have persistent hyperpituitarism, 2 of these with manifest hyperthyroidism, diabetes and hypertension. Clinically all of this group presented acromegaly. In the 3 disabled patients acromegaly was severe before operation and in the 4 well adjusted patients the acromegaly was slight. In the hypopituitary group hypometabolism is the rule. The blood cholesterol is significantly raised in the 4 patients with the lowest rates (between —30 and —40 per cent) indicating thyroid deficiency; however, in only 6 of 11 at —20 per cent is it elevated; in the other 5 it is normal, indicating that their hypometabolism is not associated with relative hypothyroidism. Thyroid administration would be of value in 10 of the hypopituitary patients to judge by hypercholesterolemia. Adrenal insufficiency was indicated by abnormally high chloride concentrations in the urines of 5 of the hypopituitary patients and in 1 of the hyperpituitary group. The 2 patients with the highest tests (as high as those found in fully developed Addison's disease) are in excellent clinical condition carrying on normal lives. This suggests that in some way the hypopituitary state of these patients avoids the sodium depletion that leads to the crises which occur in Addison's disease. Consideration of the sugar tolerance curves shows greater tolerance to sugar in the hypopituitary group but the flatness is rarely pronounced and the curves usually are entirely normal. The hyperpituitary group have a higher curve; that is, lower tolerance to sugar. This was most pronounced in the 2 patients with active acromegaly. Five of the 7 patients have abnormally high sugar tolerance curves. The more hypopituitary patients had greater susceptibility to insulin and 3 of the 7 hyperpituitary patients were unaffected by the insulin tolerance test. However, 1 of

them had a well defined insulin effect in combination with a high sugar tolerance curve. Sexual function and the condition of the sex organs indicated great deficiency in all but 3 of the hypopituitary patients. In the exceptions, normal gonadal development and function were maintained. In the hyperpituitary group, 2 were normal; in addition, 2 women had amenorrhea and hot flashes indicative of pituitary activity characteristic of the menopause, and 1 male had impotence and atrophy similar to that of the deficiency group. The authors state that their experience indicates that diagnosis of hyperpituitarism associated with nonfunctioning pituitary or embryonal tumors is frequently missed. The diagnosis would be made earlier if patients presenting signs of sexual deficiency were studied with this in mind. In women, amenorrhea and obesity are early results; in men, loss of libido and diminished beard growth occur in the incipient stage. Endocrine studies emphasize the loss of individual pituitary functions which may be replaced by the administration of the hormones of the glands normally maintained by pituitary activity; this is especially true of the thyroid. This is at —20 per cent. Increasing the rate above this will place the hypopituitary patient in relative hyperthyroidism.

Acute Perforating Cholecystitis.—Edwards and his associates collected 21 cases from two Baltimore hospitals of gallbladder perforations into the free peritoneal cavity complicating acute cholecystitis. Such perforations cause a diffuse biliary peritonitis which is highly toxic and against which the peritoneum has little resistance. The patients have been under the care of several surgeons. The authors therefore believe that their report is suggestive of the actual percentage of perforations into the peritoneal cavity which might generally be anticipated. During eleven years at the Church Home and Infirmary there were 32,921 admissions, 531 of which were for gallbladder disease and among these there were 96 acute cases with 8 perforations into the peritoneal cavity, or 8.33 per cent. During six years at the University Hospital there were 34,958 admissions, of which 593 were for cholecystitis and among these 98 were acute with 13, or 13.31 per cent, perforations into the peritoneal cavity. With a total percentage of 10.82 this serious complication cannot be regarded as rare. It is generally conceded that patients with chronic cholecystitis may have their operation deferred while being thoroughly studied and prepared, but this policy cannot be applied safely to the acute instances. This is clearly illustrated by the fact that operation was possible for only 6 of the 8 patients from the Church Home; the length of their illness prior to admission was short. The other patients were practically moribund on admission; they failed to respond to treatment and died from the overwhelming infection and toxemia. Twelve of the 13 patients of the University Hospital group were operated on. The remaining patient, ill less than twenty-four hours before admission, was not able to endure an operation. She failed to respond to treatment and died within eighteen hours of admission. There was 1 death among the Church Home group and 2 among the University Hospital group of patients. Bacteriologically, nothing new or unexpected has been observed among these 21 patients. The colon bacillus was recovered from the gallbladder of 6, *Streptococcus faecalis* from 1, *Streptococcus nonhaemolyticus* from 1 and *Staphylococcus aureus* from 1; no growth was recorded from 4 and no culture was made of the remaining 8. No attempts were made to find any pancreatic enzymes; while the regurgitation of pancreatic and duodenal juices into the gallbladder is possible under some circumstances, it is inconceivable, in view of the pathologic changes encountered in the biliary system of the patients considered. The leukocyte count averaged from 18,000 to 20,000. Other laboratory tests were of no value in determining the severity of the infection. Febrile reactions and pulse rates were variable. Roentgenograms played no part in arriving at a diagnosis. The history and physical examination were so suggestive of gallbladder disease that they have been depended on without roentgenograms. The exquisite tenderness on the slightest pressure over the gallbladder area indicates peritoneal irritation, and if present over the entire abdomen it suggests a rapidly spreading biliary peritonitis. If after the administration of dextrose and salt solution intravenously the patient

looks and feels better but shows little or no improvement on palpation, an immediate operation is indicated. In the present series there were ten cholecystectomies, seven cholecystostomies and one partial resection of the gallbladder.

Archives of Dermatology and Syphilology, Chicago 43:763-922 (May) 1941

- Endocrine Glands and Their Relation to Dermatology. E. L. Sevringhaus, Madison, Wis.—p. 763.
- Phagedaena Geometrica (Brocq): Inoculation Studies with Viable Bacteria Cultured from Lesions of Phagedaena Geometrica (Brocq), Chronic Burrowing Ulcer and Pyoderma Gangraenosum. S. S. Greenbaum, Philadelphia.—p. 775.
- Erythema Nodosum of Face: Report of Case. S. M. Bluefarb and G. E. Morris, New York.—p. 802.
- Solitary Gummatous Sporotrichosis of Two Years' Duration: Report of Case. P. V. Graham, Wheeling, W. Va.—p. 805.
- Pseudactinomycotic Epithelioma of Face. H. Charache, Brooklyn.—p. 809.
- Sarcoma Arising in Organized Hematoma Resulting from Single Trauma: Report of Case. J. J. Eller and L. H. Kest, New York.—p. 813.
- Herpes Simplex: Case of Unusually Extensive, Recurrent Type, Apparently Cured After Autoserotherapy. Carmen C. Thomas, Philadelphia.—p. 817.
- Necrobiosis Lipoidica: Form of Granuloma Annulare? F. A. Ellis, Baltimore.—p. 822.
- Acute and Subacute Disseminated Lupus Erythematosus: Treatment with Liver Extract. T. Cornbleet, Chicago.—p. 829.
- Acute Disseminated Lupus Erythematosus: Precipitation by Roentgen Rays and Cure with Sulfanilamide. H. H. Hopkins, Baltimore.—p. 833.
- Pili Torti: Report of Case. G. E. Clarke and E. L. Glicksberg, Cincinnati.—p. 836.
- Trichophytin: I. Methods of Preparation with Special Reference to Specific Skin-Reactive Factor. S. M. Peck and A. Glick, New York.—p. 839.

Archives of Neurology and Psychiatry, Chicago 45:733-902 (May) 1941

- Neuropathologic Changes Associated with Experimental Anaphylaxis in Monkey. G. A. Jervis, A. Ferraro, L. Kopeloff and N. Kopeloff, New York.—p. 733.
- *Altered Concept of Therapy of Involutional Melancholia with Estrogen and Androgen. N. O. Rothermich, Beatrice Postle and L. M. Foltz, Columbus, Ohio.—p. 752.
- Dilantin Sodium Poisoning: Report of Case with Dermatitis Exfoliativa, Pyrexia and Hepatic and Splenic Enlargement. H. Mandelbaum and L. J. Kane, Brooklyn.—p. 769.
- Peripheral Nerves in Cases of Nutritional Deficiency. C. D. Aring, W. B. Bean, E. Roseman, M. Rosenbaum and T. D. Spies, Cincinnati.—p. 772.
- Studies on Corpus Callosum. II. Higher Visual Functions in Each Homonymous Field Following Complete Section of Corpus Callosum. A. J. Akelaitis, Rochester, N. Y.—p. 788.
- Dulness as Epileptic Equivalent. T. J. Putnam, New York, and H. H. Merritt, Boston.—p. 797.
- Pick's Disease: Clinicopathologic Study and Report of Case. G. B. Hassin and D. Levitin, Chicago.—p. 814.
- Electroencephalogram of Children with Focal Convulsive Seizures. L. Casamajor, J. R. Smith, Kate Constable and C. W. P. Walter, New York.—p. 834.
- Changes in Retinal Arteries Before Convulsions Induced by Electric Shock. E. C. Milch, New York.—p. 848.

Involutional Melancholia.—Rothermich and his colleagues used estrogen or androgen for the treatment of 24 women exhibiting depressive psychoses associated with or following the menopause. The 12 patients treated with theelin received 1 mg. three times a week until at least 20 mg. was given, and those given androgen received 35 mg. of testosterone three times a week for one month and then 25 mg. three times a week until a minimum of 800 mg. was injected. The total doses and duration of treatment were determined by the response. Fourteen patients presented the classic picture of involutional melancholia and 10 an atypical picture. The changes in the physiologic state (gain in weight and a tendency toward normal, dextrose tolerance, cholesterol and metabolic rate) of all patients were definite. The response in the vaginal smear and the excretion of gonadotropin in the urine of the patients who received theelin presented the usual "follicular" changes in the vaginal smear, while the smears of those treated with testosterone indicated conversion to or persistence in the atrophic state, depending on the previous condition. Approximately half of the patients had abnormally high excretions of gonadotropin prior to therapy. Following therapy this was reduced to within normal limits in all but 1. Regular cyclic menstruation reappeared in 6 of the patients showing psychiatric improvement. Five of these are

still having monthly periods more than a year after treatment was discontinued. The other patient had eight regular periods; these were followed by typical menopausal symptoms. Psychiatrically 12 patients showed some benefit from the therapy. The criterion of improvement was the ability to return home and carry on fairly well in their own environment. Some of the patients designated as unimproved showed various degrees of decreased agitation and depression but were unable to return to their homes and hence are said to have shown no significant improvement. Only 5 of the 14 patients with classic melancholia were benefited. As spontaneous recovery is generally considered to be slightly higher than 25 per cent, the 35 per cent of results can hardly be considered therapeutically significant. In the other, or "atypical," group, 7 of the 10 patients showed clinical improvement or recovery. Follow-up studies for as long as eighteen months of these 7 patients bore out the consistency of the results in all but 2; 1 patient had been home for two months when she suffered a complete relapse and of the 12 patients who showed improvement 7 received testosterone. Of 7 in the atypical group who improved, 4 were treated with testosterone and 3 with theelin.

Archives of Ophthalmology, Chicago 25:761-940 (May) 1941

- Results of Surgical Treatment of Paralysis of Superior Oblique and Superior Rectus Muscles. S. R. Gifford, Chicago.—p. 761.
- Fundus Oculi in Diabetes Mellitus: Clinical Analysis of Appearance of Fundus in 2,360 Cases. S. H. McKee, Montreal, Canada.—p. 773.
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- Tuberculosis of Upper Respiratory Tract: Review of Literature of Past Two Years. G. B. Wood, Philadelphia.—p. 861.

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- *Pinealoma. J. H. Globus, New York.—p. 533.
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Relation of Experimental Pulmonary Arterial Hypertension to Arteriosclerosis. H. T. Karsner, M. A. Simon and T. F. Fujiwara, Cleveland.—p. 585.
*Changes in Urinary Tract and Other Organs After Administration of Three Sulfanilamide Derivatives. W. Antopol, D. Lehr, J. Churg and H. Sprinz, Newark, N. J.—p. 592.
Brain Degeneration in Young Chicks Reared on Iron-Treated Vitamin E-Deficient Ration. F. B. Adamstone, Urbana, Ill.—p. 603.
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Histologic Evidence Indicative of Natural Occurrence of Vitamin E Deficiency in Chick. F. B. Adamstone, Urbana, Ill.—p. 622.
Tattoos. G. J. Rukstinat, Chicago.—p. 640.

Pinealoma.—Globus cites 12 cases of pinealoma and stresses the microscopic character of the features of the tumor which link it to one or another histogenetic stage in the normally developing pineal body. The site of origin of the tumors was the quadrigeminal plate. A few of them appeared to be partly encapsulated, but the majority displayed an invasive character. Bilateral symmetrical hydrocephalus was always found. This is explained by the effect of the neoplasm on the underlying aqueduct of Sylvius and the resultant obstruction to the outflow of the cerebrospinal fluid. A microscopic pattern reduplicating one or another stage of the normal developing pineal body was established in every instance. In spite of the apparent cellular divergence, the structural similarity and their common pineal origin was established. It was possible to match the structure of any one of the tumors with one or another histogenetic phase of the normal pineal body and thus trace them to the common source, an embryonal rest of the pineal body. The clinical manifestations, especially the symptoms and signs of increased intracranial tension, are readily explained by the direct and indirect influence of the tumor on territorial divisions of the brain stem. The symptoms and signs include progressively intense headache, nausea, recurrent projectile vomiting, dizziness and papilledema. Diplopia, explained by the effect of the tumor on the oculomotor nuclei, occurs frequently. Argyll Robertson pupils are most frequently encountered. Skew deviation, often associated with involvement of the brachia conjunctiva, is also a fairly frequent observation. The explanation for disturbances of vegetative functions is found in the hydrocephalus caused by the effect of such a tumor on the aqueduct of Sylvius. The coincident dilatation of the third ventricle results in alterations in the hypothalamus, the part of the brain stem concerned with regulating vegetative functions. The coexistence of vegetative disorders accompanied by disturbances in the development of sex character suggests the probability that the normal evolution of sex character is but an expression of vegetative (visceral) organization of the organism. By shifting the control of the development of sex character from the pineal body to the hypothalamus, an explanation may be found for the relative infrequency of pubertas praecox in verified cases of pinealoma. The proximity of the tumor to the converging dentorubral fibers is in part responsible for the awkward use of the extremities, as unsteadiness, wide gait and other forms of ataxia. Pyramidal tract signs (paresis of the extremities, elevated deep reflexes and pathologic reflexes) are frequent. Extrapyramidal tract signs (tremor, loss of associated movements and decerebrate rigidity) are encountered.

Organic Changes After Sulfanilamide Therapy.—Antopol and his collaborators studied the macroscopic and microscopic organic changes in albino rats after single and after repeated intraperitoneal injections of the sodium salt of sulfapyridine, sulfathiazole and sulfamethylthiazole. Complete necropsies were made on more than 150 animals, special attention being given to the urinary tract. A high incidence of intrarenal precipitation and urolith formation, accompanied by severe damage to the kidneys and liver, was seen after the injection of sodium sulfamethylthiazole. The administration of large doses of sodium sulfathiazole was invariably followed by acute massive precipitation of the free drug in the urinary

tract. This phenomenon is assumed to be due to its high rate of elimination and the lack of reabsorption from the renal tubules. The precipitation in the collecting tubules was non-crystalline. On repeated administration renal concretions could be produced with each compound, and they were due to the formation of the insoluble acetylated derivatives of the compounds. Calcifying nephrosis of varying degrees, generally of the distal convoluted tubules, sometimes also of the collecting tubules, usually accompanied the concretions. A single intravenous injection of any of the sodium salt acetylated derivatives produced severe, extensive calcifying nephrosis. Utmost care should be exercised when sulfamethylthiazole is used, as this drug is apt to cause severe renal and hepatic lesions, and sulfathiazole seems more apt to produce renal damage than sulfapyridine. This is probably because of the higher insolubility of its acetylated compound and possibly because of its acute precipitation of free sulfathiazole in the urinary tract.

Archives of Surgery, Chicago

42:801-968 (May) 1941

- Carcinoma of Large Intestine: Review of 416 Autopsy Records. R. E. Buirge, New Hampton, Iowa.—p. 801.
Surgical Lesions of Pancreas: Review. W. Walters and W. H. Cleveland, Rochester, Minn.—p. 819.
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Selection of Cases for Peritoneoscopy. C. A. Beling, Newark, N. J.—p. 872.
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California and Western Medicine, San Francisco

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Canadian Medical Association Journal, Montreal

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- Influence of Epinephrine and Adrenal Cortical Extract on Lactogenic Property of Prolactin. D. R. Climenko and E. W. McChesney, Rensselaer, N. Y.—p. 710.
- Electrophoresis of Antihormone Serums. K. W. Thompson and J. L. Melnick, New Haven, Conn.—p. 723.
- Increased Estrogenic Potency of Human Urine After Zinc Hydrochloric Acid Hydrolysis. O. W. Smith and G. Van S. Smith, Brookline, Mass.—p. 740.
- Endocrine Factors Influencing Tumor Development: Effect of Gonadotropins and of Theelin on Marsh-Buffalo Adenocarcinoma and Lymphosarcoma. F. Bischoff, M. Louisa Long, J. J. Rupp and Georgena J. Clarke, Santa Barbara, Calif.—p. 769.
- Effect of Hyperpyrexia on Spermatozoa Counts in Men. J. MacLeod and R. S. Hotchkiss, New York.—p. 780.
- Bromine and Thyroid. E. J. Baumann, D. B. Sprinson and D. Marine, New York.—p. 793.
- Nitrogen Metabolism in Hyperthyroidism. B. Sure, Z. W. Ford Jr., R. M. Theis and M. Goldfischer, Fayetteville, Ark.—p. 806.
- Influence of Iodine Feeding on Normal Thyroid with Reference to Its Relative Potency in Stimulating Metabolism and Heart Rate. A. E. Meyer and Helen Danow, with technical assistance of Alice V. Hellegers, Brooklyn.—p. 816.
- Effect of Steroid and Pituitary Hormones on Experimental Diabetes Mellitus of Ferrets. G. Dolin, S. Joseph and R. Gaunt, New York.—p. 840.

Journal of Clin. Endocrinology, Springfield, Ill.

1:375-460 (May) 1941. Partial Index

- Therapy in Cushing's Syndrome: Cushing's Syndrome Interpreted as Hyperadrenocorticism Leading to Hyperglucocorticism: Results of Treatment with Testosterone Propionate. F. Albright, W. Parson and Esther Bloomberg, Boston.—p. 375.
- *Insulin Resistance: Critical Survey of Literature with Report of Case. W. P. Martin, Helen Eastman Martin, R. W. Lyster and S. Strouse, Los Angeles.—p. 387.
- Id.: Association of Extreme Insulin Resistance with Allergy: Report of Case. J. F. Hart and C. A. Vicens, New York.—p. 399.
- Hyperinsulinism: Asthma, Diabetes Mellitus and Hyperinsulinism. E. M. Abrahamson, Brooklyn.—p. 402.
- Inhibition of Lactation: Percutaneous Use of Testosterone. A. J. Fleischer and J. I. Kushner, New York.—p. 407.
- Stillbirth: Use of Stilbestrol in Suppression of Lactation. S. D. Soule and A. R. Bortnick, St. Louis.—p. 409.
- Id.: Treatment of Menopause with Stilbestrol. S. G. Taylor 3d and W. O. Thompson, Chicago.—p. 411.
- Homosexuality: Criteria for Hormone Explanation of the Homosexual. A. C. Kinsey, Bloomington, Ind.—p. 424.
- Hypopituitarism: Simmonds' Disease Associated with Pernicious Anemia, with Bioassay of Large Chromophobe Adenoma. M. A. Foster and J. C. McCarter, Madison, Wis.—p. 436.
- Pituitary Pathology: Vacuolization of Basophil Cells of Pituitary Body (Pars Distalis) in Relation to Age, Menstruation and Thyroidism. A. D. Ecker, Syracuse, N. Y.—p. 442.
- Acromegaly: Thyroid Gland in 166 Cases of Acromegaly. A. C. Davis, Rochester, Minn.—p. 445.
- Dihydrotyrosol: Modern Treatment of Parathyroid Insufficiency. F. Holtz, Berlin, Germany.—p. 453.

Insulin Resistance.—Martin and his colleagues consider patients resistant to insulin when after forty-eight hours of observation 200 or more units of insulin fails to bring about an appreciable lowering of the blood sugar. Cases of insulin resistance of both known and unknown etiology are included in this definition. The known factors are acidosis, infection, sepsis, overactivity of the physiologic antagonists of the pancreas, pituitary, thyroid and adrenal, and hepatic disease such as hemochromatosis. The definition is arbitrarily made on the combined basis of time and the amount of insulin. The precipitating factor in a case reported by the authors was apparently hypersensitivity to protamine zinc insulin, which produced a generalized urticaria. Although these lesions cleared in three days following cessation of protamine zinc insulin and the administration of calcium gluconate, the expected response to crystalline insulin or to regular insulin was not forthcoming. The patient's history of the development of an itching erythematous lesion of the head and neck three years earlier suggested an allergic background, although the condition was not diagnosed as such. The early lesion was not caused by protamine zinc insulin. Infection is a frequent cause of insulin resistance, although the resistant phase is usually transient. Local peritonitis about the cecum observed at necropsy in their patient was not suspected during life, and the authors believe that it developed shortly before death. The incidental finding of a

small hypernephroma further complicated the picture, although there is little likelihood that it had any bearing on the resistance. On the second day following admission to the hospital 995 units of insulin and on the next day 1,190 units was used. At this time the blood sugar dropped from 541 to 295 mg. per hundred cubic centimeters and the carbon dioxide combining power rose from 18 to 48 volumes per cent. The next day only 205 units of insulin was necessary to maintain the blood sugar between 221 and 294 mg., while the carbon dioxide combining power steadily rose to 60 volumes per cent. However, within forty-eight hours of observation 275 and 255 units of insulin on two successive days was insufficient, as the blood sugar rose slowly and the carbon dioxide combining power diminished. It is possible that, had the significance of the associated allergic state with insulin resistance been appreciated and had massive doses of insulin been continued during these two critical days, death might have been averted. In reviewing cases reported as examples of insulin resistance, the authors had difficulty in selecting those which fell into their classification and definition. Immediately after the discovery of insulin, many examples of presumed insulin resistance were published which in fact were only temporary changes in insulin need. Only those examples of insulin resistance which lasted forty-eight hours or longer and required 200 or more units of insulin daily are tabulated in detail; there are 5 cases due to disturbances of the endocrine glands, 5 due to infection (pyelitis, sepsis or tuberculosis), 5 due to hepatic disorders, 8 due to cutaneous and allergic disorders (urticaria, eosinophilia and bronchial asthma) and 2 unexplained cases. The first step in the treatment of insulin resistance is to determine the etiology and to eliminate it if possible. Insulin sensitivity should be tested for and the type and brand and route of administration should be changed if necessary. Crystalline insulin is least likely to produce allergy. Evidence indicates that there is not necessarily any upper limit to the number of units of insulin which may be given. General therapeutic measures should be directed against all the possible contributory factors. Other empiric measures worthy of trial include endocrine therapy (estrogenic preparations, solution of parathyroid), intravenous phosphate solutions, change in type of carbohydrate in the diet, vitamin B, pituitary irradiation and desensitization.

Journal of Clinical Investigation, New York

20:249-332 (May) 1941

- Further Observations on Skin Reactions to Antigens from Heterologous Cestodes in Echinococcus Disease. J. T. Culbertson and H. M. Rose, New York.—p. 249.
- Calcium and Phosphorus Metabolism in Osteomalacia: XI. Pathogenic Role of Pregnancy and Relative Importance of Calcium and Vitamin D Supply. S. H. Liu, H. I. Chu, H. C. Hsu, H. C. Chao and S. H. Cheu, Peiping, China.—p. 255.
- *Observations on Effect of Streptococcal Upper Respiratory Infections on Rheumatic Children: Three Year Study. Ann G. Kuttner and Elma Krumwiede, Irvington-on-Hudson, N. Y.—p. 273.
- *Epidemic of Influenza B Occurring in Group of Rheumatic Children Concurrent with Outbreak of Streptococcal Pharyngitis: Clinical and Epidemiologic Observations. Gertrude Reyersbach, T. F. Lenert and Ann G. Kuttner, Irvington-on-Hudson, N. Y.—p. 289.
- Studies of Calcium and Phosphorus Metabolism: XVI. Influence of Pituitary Gland. W. Bauer and J. C. Aub, Boston.—p. 295.
- Acid-Base Balance, Renal Function and Gastric Secretion During Hypochloremia in Dog. J. B. Kirsner and Kathryn Knowlton, Chicago.—p. 303.
- Clinical Studies on Pyridoxine (Vitamin B₆). J. Flexner and M. R. Classin, New York.—p. 313.
- Demonstration That the Cell Plasma Ratio of Blood Contained in Minute Vessels Is Lower Than That of Venous Blood. R. V. Ebert and E. A. Stead Jr., Boston.—p. 317.
- Clearance of Bilirubin from Plasma: Measure of Excreting Power of Liver. A. A. Weech, Dorothea Vann and Rose A. Grillo, New York.—p. 323.

Streptococcal Respiratory Infections and Rheumatic Fever.—Kuttner and Krumwiede studied over a period of three years the association between streptococcal infections of the upper part of the respiratory tract and rheumatic fever in 108 children who had had one or more attacks of polyarthritis or earditis without severe cardiac damage. The subjects lived and went to school in the same building at the Irvington House, a sanatorium for rheumatic children. They had no contact with other children, and each child was permitted only two adult visitors every six weeks. The group varied in age from 6 to 15 years. Rectal temperatures and pulse rates were taken

three times daily. Leukocyte counts, hemoglobin estimations and erythrocyte sedimentation rates were done every three or four weeks. Children with symptoms of infection of the upper part of the respiratory tract were put to bed in isolated cubicles or in separate rooms. Leukocyte counts were taken on the first or second day of illness. Three outbreaks of streptococcal infection occurred during three successive winters. Each epidemic was associated with group A beta hemolytic streptococci of a single but a different prevalent type. The incidence of rheumatic recurrences following the three waves of streptococcal pharyngitis varied. In the first, following a latent period, half the children showed signs of rheumatic activity, in the second all the children escaped rheumatic sequelae and in the third recurrence developed in a small proportion. A comparison of the streptococci associated with the recurrences and the "non-effective" strain failed to show any significant differences. Following infection with the two "effective" strains of streptococci, rheumatic recurrences developed sporadically over months. It is therefore assumed that these organisms carried the hypothetical rheumatic factor throughout the epidemics. As in many children who had streptococcal pharyngitis demonstrable signs of rheumatic activity did not develop, it is suggested that these individuals may have been in a refractory state. Thirty-one children who contracted the "effective" streptococcus type 27 pharyngitis within five years following their first attack of polyarthritis or carditis escaped cardiac involvement. During 1937-1938 the probable source of the epidemic strain was a patient who was a streptococcus carrier; during 1938-1939 and 1939-1940 the probable sources were 2 children who had acute infections of the upper part of the respiratory tract as the result of outside contacts. During all three years a fairly large proportion of the children were carriers of group A beta hemolytic streptococci of various types, which in most instances did not spread or cause pharyngitis. Some of these carrier strains had capsules and formed mucoid colonies. It is the authors' impression that instances of pharyngeal infection due to types of streptococci not previously present in the community are the most likely sources of epidemic strains. Therefore the exclusion of rheumatic children from sanatoriums or convalescent homes because they are carriers of small or moderate numbers of group A beta hemolytic streptococci does not seem warranted. Many children who have had streptococcal pharyngitis continue to harbor streptococci for months after recovery. There is no effective way of clearing up streptococcus carriers, and it is not feasible to isolate children for months at a time. The role of group A beta hemolytic streptococci in regard to rheumatic fever is analogous to that which prevailed in regard to scarlet fever before the discovery of erythrogenic toxin and the Dick test. Yearly fluctuations in the resistance of rheumatic individuals may be more important in precipitating rheumatic recurrences than qualitative or quantitative differences between strains of streptococci. The study of the relationship of streptococci to the etiology of rheumatic fever should be continued, with the thought in mind that streptococci may be indicators which accompany the invasion or reactivation of a hypothetical rheumatic agent. The entrance or increased activity of this agent may enhance the infectivity of streptococci. If this hypothesis is true, the failure of rheumatic sequelae to develop in some children following pharyngitis due to "effective" strain of streptococci might be explained on the basis that reinfection with exogenous rheumatic "virus" or reactivation of endogenous rheumatic "virus" had not taken place at that particular time.

Influenza B and Streptococcal Pharyngitis in Rheumatic Children.—According to Reyersbach and her co-workers, in February 1940 a third type of infection of the upper part of the respiratory tract, an epidemic influenza, was observed for the first time at Irvington House. The influenza developed in rapid succession in 50 of the rheumatic children housed there. The outbreak is of special interest because a new virus serologically distinct from influenza A was isolated. The immunologic studies of Francis showed that the same or a closely related etiologic agent was also responsible for other epidemics occurring in widely separated parts of the United States. He designated the virus influenza B. The symptoms caused by influenza B closely resembled those associated with influenza A infection. The disease was mild, with constitutional rather

than catarrhal symptoms predominating. Leukocyte counts of the 50 influenza B patients showed a relative leukopenia. Pharyngitis due to type 27 group A beta hemolytic streptococci was prevalent in the community before the influenza B epidemic. No evidence was obtained to suggest that influenza B facilitated the spread of group A beta hemolytic streptococci. The explosive character of the influenza B outbreak indicated that all susceptible individuals contracted the infection in a relatively short time. Susceptibility to the streptococcus type 27 pharyngitis was less severe; new cases developed over a period of six months. The susceptibility of the same child varied from time to time. In spite of intimate exposure to the streptococcal infection, pharyngitis failed to develop in some children and did so only several weeks later. The most striking difference was the absence of signs and symptoms referable to the upper respiratory tract in most influenza B infections. In the streptococcal infections nearly all the patients complained of "sore throat," and definite inflammation of the pharynx was usually apparent. The most valuable laboratory finding in establishing the diagnosis of influenza B was the leukocyte count. By this means it was usually possible to differentiate cases of the virus infection from streptococcus type 27 pharyngitis on the first day of illness. A relative leukopenia was found in all patients with influenza B and a definite leukocytosis in most patients with the streptococcal infection. Following a latent period rheumatic recurrences developed in 8 of the 39 patients who had the streptococcus type 27 pharyngitis, whereas no instance of a rheumatic exacerbation followed the influenza B infection.

Journal Industrial Hygiene & Toxicology, Baltimore 23:163-216 (May) 1941

X-Ray Diffraction: Important Tool in Pneumoconiosis Research and New Method of Tissue Analysis. L. H. Berkelhamer, New York.—p. 163.

*Silicosis in Soft Coal Miners. B. G. Clarke and C. E. Moffet, Cambridge, Mass.—p. 176.

Fundamental Factors in Design of Lateral Exhaust Hoods for Industrial Tanks. L. Silverman, Boston.—p. 187.

Automatic Carbon Disulfide Recorder. B. E. White and W. R. Calvert, Lewistown, Pa.—p. 196.

Chemical and Physiologic Investigation of Electric Arc Welding: III. Coated Welding Rods. C. P. McCord, G. C. Harrold and S. F. Meek, Detroit.—p. 200.

Silicosis in Soft Coal Miners.—Clarke and Moffet present results of a roentgen study of chests and the occupational histories of 774 miners of bituminous coal. The subjects had had at least one year of experience in bituminous coal mining; 43, or 5.6 per cent, of them were retired or deceased employees or rejected applicants. Among the 774 workers there were 8 instances of nodulation, in 4 of which there was roentgen evidence of healed or active tuberculosis. Five of the men contracted silicosis working as underground coal loaders for from twenty-three to thirty-six years, 1 of the men had been an undercutting machine operator for sixteen years, 1 had been a rock driller for eleven years and 1, a Scotsman, may have acquired his condition abroad. Roentgen evidence of healed and active adult type tuberculosis appeared in 7.4 per cent of the miners, which is comparable with the figure of 6.5 per cent for a control group of steel plant workers. When the coal miners are grouped by duration of exposure, the incidence of adult type tuberculosis tends to increase with increased duration of employment; when grouped by age a similar higher incidence of tuberculosis appears among the older workers. The trend is probably not peculiar to coal miners, as when the control group of steel plant workers are grouped by age there is an increase on roentgen evidence of healed and active tuberculosis among the older men. In studying the incidence of silicosis among workers performing different occupations the authors find that, after twenty years of experience as bituminous coal loaders, silicotic nodulation may develop in them. In undercutting machine operators, who work under extremely dusty conditions, presilicotic pulmonary changes are apt to develop. Of these workers 67 per cent show peritruncal exaggeration after twenty years of exposure and 16.2 per cent of machinemen and drillers show peritruncal exaggeration as compared with 2.1 per cent among the 774 bituminous coal workers examined and 1 per cent among the steel plant workers studied.

Journal-Lancet, Minneapolis

61:143-202 (May) 1941

- Child Psychiatry and Pediatrics. R. A. Jensen, Minneapolis.—p. 143.
Public Health Aspects of Premature Infant Care in Minnesota. V. O. Wilson and A. J. Chesley, Minneapolis.—p. 147.
Erythroblastosis Foetalis. R. V. Platon, Minneapolis.—p. 151.
Use of Fluids in Pediatrics. J. A. Anderson and M. R. Ziegler, Minneapolis.—p. 155.
Pediatrician and Orthodontist. W. Hyde, Minneapolis.—p. 161.
Congenital Diaphragmatic Hernia. O. S. Wyatt, Minneapolis.—p. 164.
Hemangiomas: Classification and Treatment. L. H. Winer, Minneapolis.—p. 168.
Evaluation of Nutritional Status of Children. Arild E. Hansen, Minneapolis.—p. 172.
Clinical Evaluation of Beta Lactose as Prelacteal Feeding. A. J. Moss, E. L. Strem and A. V. Stoesser, Minneapolis.—p. 175.
*Dilantin Sodium Therapy in Epileptiform Seizures of Children. Elizabeth C. Lowry, Minneapolis.—p. 178.
Easing Convalescence. E. K. Clarke, Minneapolis.—p. 181.
Essential Hypertension. T. D. Allen, Evanston, Ill.—p. 183.
Role of the General Practitioner in Detecting Tuberculosis. C. Northrop, San Haven, N. D.—p. 187.
X-Ray Therapy in Infections and Tumors. R. G. Allison, Minneapolis.—p. 190.

Phenytoin Sodium Therapy in Epileptiform Seizures.—Lowry used phenytoin sodium in the treatment of epileptiform seizures of 34 children from 5 months to 16 years of age. The children were placed on a water restriction diet (900 cc. a day). The dosage of phenytoin ranged from 0.2 to 0.4 Gm. daily, depending on the age and the tolerance of the child. Twenty-four had grand mal attacks, 2 had petit mal and 8 had seizures of both types. Two thirds of the children were treated for one year or more and one fifth for two years or more. The following results were obtained: In 3 there was a complete cessation of seizures, 19 were improved (only 5 moderately) and 12 were not benefited. In many the attacks became milder. The 65 per cent of favorable results are comparable to experiences of most workers, but some have reported a higher percentage of complete remissions. In all but 1 (whose seizures ceased) of the 23 children who received phenytoin sodium continuously for a year or more the benefit was maintained throughout the period of observation without any increase in dosage, indicating that in general children do not acquire a tolerance for the drug. Most of the patients felt no ill effect from the medication. Patients with the most frequent attacks were most benefited. Phenobarbital and phenytoin sodium was given to patients whose response to the latter medication was unsatisfactory, and enough of these children improved to suggest that the combination was worth trying when other methods failed.

Journal of Neurophysiology, Springfield, Ill.

4:209-284 (May) 1941. Partial Index

- Multiple Motor Innervation of Frog's Sartorius Muscle. B. Katz and S. W. Kuffler, Sydney, Australia.—p. 209.
Availability of Lactic Acid for Brain Oxidations. J. Wortis, K. M. Bowman, W. Goldfarb, J. F. Fazekas and H. E. Himwich, New York.—p. 243.
Cortical Extinction in Convulsions. R. Meyers, Brooklyn.—p. 250.
Experimental Study of Gastric Activity Released from Cortical Control. F. H. Hesser, O. R. Langworthy and L. C. Kolb, Baltimore.—p. 274.

Journal of Pharmacology & Exper. Therap., Baltimore

72:1-122 (May) 1941

- Comparison of Ephedrine and Eserine. J. D. P. Graham and M. R. Gurd, Oxford, England.—p. 48.
Action of Adrenalin and Potential Changes in Cat Uterus. G. Balassa and M. R. Gurd, Oxford, England.—p. 63.
*Method for Determining Loss of Pain Sensation. F. E. D'Amour and D. L. Smith, Denver.—p. 74.
Action of Prostigmine on Circulatory System. R. Mendez and A. Ravin, Boston.—p. 80.
Action of Pitocin and Adrenalin on Different Segments of Rabbit Uterus. D. D. Bonycastle and J. K. W. Ferguson, Toronto, Canada.—p. 90.
Comparative Effects of Sulfonamide Compounds as to Anemia and Cyanosis. A. P. Richardson, San Francisco.—p. 99.
Relationship Between In Vitro and In Vivo Activity of Sulfonamide Compounds. H. J. White, A. C. Bratton, J. T. Litchfield Jr. and E. K. Marshall Jr., Baltimore.—p. 112.

Determining Loss of Pain Sensation.—D'Amour and Smith determined the analgesic properties of cobra venom in doses of 4, 8 and 16 mouse units per kilogram of body weight, sodium amytal in doses of 25 and 50 mg., tarantula venom in doses of 10 milkings per rat, and black widow spider venom in doses of $\frac{1}{8}$, $\frac{1}{4}$ and $\frac{1}{2}$ lethal doses. Five opiates, dilaudid,

morphine sulfate, codeine sulfate, diacetylmorphine and pantopon, were assayed at either three or four dosage levels, 12 rats being used for each dose level. By complete analgesia is meant the complete loss of reaction to pain: the animal makes no movement of the tail even though it is being burned to a crisp; however, a white blistering appearance is sufficient. The method used was to focus the rays from a Mazda 1184, from 6 to 8 volt bulb, with reflector, on the tip of the rat's tail, which was placed in a grooved board some 6 inches below. The setup includes a voltage regulator, transformer and rheostat; a stopwatch is operated by the same switch that makes and breaks the current. The operator places the rat's tail in the groove, switches on the light and stopwatch and waits for the response, which is a sudden, typical twitch of the tail when the animal feels the pain. After a few trials a light intensity which produced a reaction in about five seconds was found to be most convenient. The authors' assay of the opiates gave results in agreement with their accepted clinical value. A survey of doses recommended in a number of treatises indicates that dilaudid and diacetylmorphine are considered to be approximately four times as active as morphine, and codeine and pantopon about half as active as morphine. The results of the study approximated this ratio of effectiveness. The authors are unable to explain the discrepancy between their observations and those of Macht concerning cobra venom. On a dosage of 0.5 mouse unit (using 7 rats) he found an increase in the pain threshold, but in no case did the increase exceed the maximal stimulus (809 volts) found necessary at times in control rats. Only 2 rats were used on each of the higher doses, and the 2 on 2 mouse units gave inconsistent results in that the pain threshold in 1 was increased significantly (from 185 to 1,080 volts) but in the other only from 185 to 445 volts. The weight of the rats was not mentioned. In their study (the rats weighed approximately 250 Gm.) the authors noticed no effect on the reaction time. A dose of 16 mouse units per kilogram of body weight is approximately one half of the lethal dose. Although they make no claim that the method is capable of determining the analgesic power of drugs when deep seated, continuous pain is involved, nevertheless a method so simple and rapid should be of value in experimentally verifying many statements found in books on pharmacology the evidence for which rests usually on uncontrolled clinical impressions. Such questions as the influence on dosage of the route of administration and duration of analgesia, the analgesic properties of antipyretics, barbiturates and other drugs, the potentiating effects of one drug on another and the testing for analgesic properties of new drugs could be determined. The authors are engaged on certain of these studies.

Missouri State Medical Assn. Journal, St. Louis

38:143-184 (May) 1941

- Chronic Cervicitis. G. F. Pendleton, Kansas City.—p. 143.
The Vaghyptonic Individual: Preliminary Report. D. G. Stine, Columbia.—p. 147.
Irritable Colon. J. M. Rumsey, Kansas City.—p. 152.
Use of Androgenic Hormone in Gynecology. S. Weber, St. Louis.—p. 155.
Pernio (Chilblains). C. L. Schaefer and C. E. Sanders, Kansas City.—p. 159.
Acute Anterior Poliomyelitis: Review. G. R. Peters and M. L. Peters, Cameron.—p. 160.

38:185-220 (June) 1941

- Ideals of Medical Practice. C. E. Burford, St. Louis.—p. 185.
We Live to Serve and Not Serve to Live. R. B. Denny, Creve Coeur.—p. 187.
Practical Points in Meeting the Poor Surgical and Anesthetic Risks. R. R. Coffey, Kansas City.—p. 188.
*Treatment of Burns. W. R. Hewitt, St. Louis.—p. 191.
Improvement in Action of Procaine Salts in Caudal Anesthesia. M. M. Marks, Kansas City.—p. 196.
Infections of Urinary Tract: Treatment in General Practice. R. O. Pearman, St. Joseph.—p. 197.
Differentiation of Toxic Goiter from States Simulating Hyperthyroidism. R. W. Bartlett, St. Louis.—p. 200.

Treatment of Burns.—Hewitt discusses second degree burns which involve from 20 to 60 per cent of the surface of the body. Since 1935 he has followed the Davidson-Bettman method of treating burns with silver nitrate and tannic acid. On the face and hands a 2 per cent gentian violet is more

desirable, since it produces a thinner and more supple tan which, when it loosens about the eighth day, leaves a healed area. A triple dye may be used instead, but no method is completely satisfactory. The tannic acid and silver nitrate gives an eschar which leaves a viselike fixation of the eyelids which is uncomfortable and may lead to corneal ulceration. Greases of all sorts should be abandoned. In third degree burns coagulation should be avoided, and débridement and local dressing with petrolatum should be employed. As soon as the patient is in a bed tent and proper sedation and cleansing under anesthesia followed by swabbing with tannic acid and spraying with silver nitrate have been carried out, 1,000 cc. of plasma is administered to an adult and from 150 to 250 cc. to a child. Whole blood should be used to correct anemia and to combat infection. The danger of heat stroke exists when the outside temperature and humidity are high. Dusting with zinc stearate as the eschar rolls up is of value, but the danger of an allergic reaction exists. It is important to get the patient out of bed as soon as possible to prevent the development of a neurosis and to assist healing. Amphetamine sulfate is valuable in improving the patient's morale. Second degree burns of children become healed within twenty-one days if treated vigorously, and those of adults in from six to eight weeks. Some form of adrenal cortex should be given at once to prevent exhaustion or depletion of the reserve. Its value is not comparable to the use of plasma. Since protein enters into the chemical makeup of many hormones and enzymes, a minimum of 100 Gm. of meat daily may be of value, since it provides amino acids; two or three eggs may be added to the daily diet.

Nebraska State Medical Journal, Lincoln

26:119-158 (April) 1941

- Sterility: The Internist's Examination of a Sterile Couple. J. C. Sharpe, Omaha.—p. 119.
 Id.: The Urologist's Role. C. A. Owens, Omaha.—p. 121.
 Id.: Physiology of Reproduction and Investigation of Sterility in the Female. W. E. Brown, Ann Arbor, Mich.—p. 123.
 Prevention of Ivy Poisoning. W. H. Kerr, R. C. Danley, Hamburg, Iowa; L. A. Gaukel, P. L. Wolpert, Onawa, Iowa; L. S. Pucilek, Plattsmouth, and E. Cline, Auburn.—p. 129.
 Hydranencephalus with Cerebellar Hemidysgenesis. J. Minckler, T. McCurdy and J. C. Iversen, Omaha.—p. 131.
 Curare in Treatment of Tetanus: Case Report. S. E. Isacson and S. A. Swenson Jr., Omaha.—p. 136.
 Ideal Vaccination Technic. H. M. Page, Portland, Ore.—p. 138.
 Smallpox in Nebraska. R. H. Loder, Lincoln.—p. 139.

26:159-198 (May) 1941

- *Differential Diagnosis of Rheumatic Fever: Study of Diagnosis Made by Referring Physician in 167 Cases. A. E. Hansen, Minneapolis.—p. 159.
 Tularemia. A. S. Rubnitz and A. M. Harris, Omaha.—p. 164.
 Poliomyelitis: Case Report. E. V. Wiedman, Lincoln.—p. 170.
 Id.: Physical Findings and Treatment. R. Stein, Lincoln.—p. 171.
 Orthopedic Considerations in Poliomyelitis. C. F. Ferciot, Lincoln.—p. 173.
 Fibroma of Transverse Colon: Report of One Case. E. A. Watson and D. P. Watson, Grand Island.—p. 175.
 Progress in Prematurity Care. R. H. Loder, Lincoln.—p. 177.
 Mantoux Test versus Vollmer Patch Test. J. D. LeMar, Omaha.—p. 180.
 Scurvy. J. P. Tollman and R. L. Spradling, Omaha.—p. 184.

Differential Diagnosis of Rheumatic Fever.—Hansen reviews the diagnoses made by referring physicians on 167 children seen at the University of Minnesota Hospital from 1931 to 1940. In 28 instances the diagnosis of rheumatic fever was made. The condition most accurately and frequently diagnosed was chorea, this being present in 42 of the 167 cases. The diagnosis of rheumatic arthritis was made on 4 patients, while 3 patients were sent in because of joint stiffness and 2 because of joint pains. There were 23 referred with the diagnosis of rheumatic heart disease, while an additional 26 were sent in with such diagnoses as murmur, heart disease, heart infection, endocarditis, leakage of the heart, mitral heart disease and decompensation. Two instances were referred with a diagnosis of congenital heart disease. No diagnosis was given in 10. Of 27 with miscellaneous diagnoses 11 had abdominal pain, in 7 the diagnosis was appendicitis and in others it was poliomyelitis, osteomyelitis and septicemia. These data confirm the statements made in many pediatric textbooks that appendicitis, poliomyelitis, osteomyelitis, septicemia and certain cutaneous eruptions as well as various respiratory infections are frequently confused with rheumatic fever. In about one fourth of the patients the

referring physician found it difficult to recognize the disease. On the other hand, the major symptoms were recognized as important in a high percentage of the patients, although carelessness was often exhibited in the use of the exact nomenclature. The highest degree of accuracy in the diagnosis of rheumatic fever is possible when one is thoroughly familiar with its varied manifestations.

New England Journal of Medicine, Boston

224:755-792 (May 1) 1941

- Reduction of Pain and Other Undesirable Reactions Due to Pneumoencephalography. T. J. C. von Storch and H. H. Karr, Boston.—p. 755.
 Estimation of Operative Risk in Patients with Cancer. A. S. Johnson, Springfield, Mass., and H. L. Lombard, Boston.—p. 759.
 Prothrombin Level in Early Infancy: Its Relation to Hemorrhage and Other Neonatal Disturbances. G. Edsall, Boston.—p. 762.
 Neurosurgery. D. Munro, Boston.—p. 766.

224:793-836 (May 8) 1941

- Precancerous Dermatoses. O. S. Ormsby, Chicago.—p. 793.
 *Acute Typhoid Cholecystitis and Cholelithiasis Occurring Forty-Three Years After Typhoid Fever: Report of Case. T. W. Botsford, Boston.—p. 799.
 Clinical and Laboratory Observations on Hemoglobinuria Occurring During Sulfanilamide Therapy. D. R. Gilligan and I. Kapnick, Boston.—p. 801.
 Bacteriology: Significance of Bacteriologic and Immunologic Procedures in Diagnosis and Treatment of Infections. C. A. Janeway, Boston.—p. 813.

Cholecystitis and Cholelithiasis Forty-Three Years After Typhoid.—Botsford cites an instance of acute suppurative cholecystitis due to *Eberthella typhi* forty-three years after the original attack of typhoid. The patient had her initial attack of cholecystitis a few weeks subsequent to recovery from the typhoid. Four attacks of cholecystitis followed at irregular intervals, but it was forty-three years after the typhoid that she was subjected to operation. The last attack was the most severe and was a true suppurative cholecystitis with perforation of the gallbladder and formation of an extravascular abscess. The virulence of the infective agent was demonstrated by the stormy clinical course. The high virulence of *E. typhi* was well demonstrated after forty-three years by the recovery of the organisms in pure culture from the bile, from the pus in the extravascular abscess and from the center of a gallstone. The patient, a mother of a large family, did all the cooking and yet she caused no known instance of typhoid. She must have been discharging typhoid organisms in her feces for years, if only intermittently. No stool cultures were made preoperatively, but of ten after the cholecystostomy tube was removed only two were positive for *E. typhi*. These positive cultures were the last of the series and were taken fourteen and thirty days respectively after the bile ceased draining through the tube. Because the patient was a poor operative risk, the gallbladder was not removed. Although drainage and removal of the stone still make her a typhoid carrier, the gallbladder is now free of a porous foreign body that contained *E. typhi*, and in time the viscus may become sterile. Under the circumstances it was probably wiser to have a living typhoid carrier than an operative fatality after a cholecystectomy.

New York State Journal of Medicine, New York

41:1123-1218 (June 1) 1941

- Medical Problems in National Defense: From Point of View of the Army Medical Officer. C. M. Watson, Governors Island.—p. 1147.
 Id.: Community Health in Areas Adjacent to Military Posts and in Defense Industries. A. E. Russell, Governors Island.—p. 1155.
 Id.: From Point of View of the State Health Department. V. A. Van Volkenburgh, Albany.—p. 1158.
 Id.: The Part of the Civilian Physician in the Defense Program. J. D. Naples, Buffalo.—p. 1163.
 Subnormal Vision and Occupational Aptitude. A. C. Snell, Rochester.—p. 1165.
 Practice of Radiology. H. K. Taylor, New York.—p. 1172.
 Contrast Cineurotenography of Circulatory Organs. W. H. Stewart, C. W. Breimer and H. C. Maier, New York.—p. 1174.
 New Angle on Trigeminal Neuralgia: Study of 245 Cases with Observations on Seasonal Occurrence and Surgical Technic. H. W. Williams, Rochester.—p. 1177.
 Amebic Dysentery as Complication in Diagnosis of Carcinoma of Rectum. A. A. Landsman, New York.—p. 1181.
 Gallbladder Disease: Consideration of Mortality. C. G. Heyd, New York.—p. 1183.

North Carolina Medical Journal, Winston-Salem

2:165-216 (April) 1941

- Etiology and Pathology of Cholecystic Disease. E. J. Wannamaker, Charlotte.—p. 165.
Signs and Symptoms of Cholecystic Disease. S. F. Le Baner, Greensboro.—p. 166.
Roentgenologic Consideration of Cholecystic Disease. W. T. Rainey, Fayetteville.—p. 168.
Evaluation of Laboratory Procedures in Cholecystic Disease. E. B. Craven Jr., Lexington.—p. 170.
Diagnosis of Gallbladder Disease (Correlation of History, Physical Examination and X-Ray Evidence). W. M. Johnson, Winston-Salem.—p. 173.
Differential Diagnosis of Cholecystitis. W. R. Johnson, Asheville.—p. 175.
Management of Cholecystic Disease. J. M. Ruffin, Durham.—p. 177.
The Psycho-neuroses. F. R. Taylor, High Point.—p. 178.
Primary Peritonitis. C. Bunch, Charlotte.—p. 184.
Prenatal Syphilis. J. M. Arena and D. E. Plummer, Durham.—p. 188.
History of Urology in North Carolina. J. S. Rhodes, Raleigh.—p. 191.
The Veterans Administration. B. A. Cockrell, Fayetteville.—p. 196.

Southern Surgeon, Atlanta, Ga.

10:301-378 (May) 1941

- Cod Liver Oil Therapy of Wounds and Burns. P. C. Hardin, Monroe, N. C.—p. 301.
Hormone Therapy of Fibromyomas of Uterus. R. B. Greenblatt and E. A. Wilcox, Augusta, Ga.—p. 339.
Diagnosis and Treatment of Ectopic Pregnancy. F. H. Falls, Chicago.—p. 347.
Treatment of Acute Fractures of Neck of Femur. H. B. Boyd, Memphis, Tenn.—p. 364.

Cod Liver Oil for Wounds and Burns.—Hardin reviews the literature on the use of cod liver oil as a dressing for wounds and burns and states that among its advantages as a dressing are the following: The oil is sterile and bactericidal, it is stimulating to granulation and epithelization, it accelerates liquefaction of dead tissue, it produces a beneficial local and systemic response and, as it also acts as a protective layer between the lesion and the dressing, each change of dressing is painless and as the gauze does not adhere to the wound there is no loss of the much needed blood from granulations. The author found cod liver oil therapy especially applicable to extensive crushing or destructive injuries, compound fractures, gunshot wounds, open amputation stumps, abscess cavities, large infected wounds; major primary burns and extensive ulcerations from burns or other causes: to sum up, for any injury with loss of tissue in which immediate surgical closure is not feasible. During the last five years he has used the oil as a dressing for 346 wounds and burns. During the first four years he used a home-made ointment composed of from 50 to 80 per cent of U. S. P. or high potency cod liver oil and petrolatum. During the last year he tried out six commercially manufactured cod liver oil ointments and he was not able to distinguish between their therapeutic activity. All were effective and all appeared definitely superior to home-made ointments. Each has a pleasing odor, a genuine advantage over the fish odor of home-made ointments. The commercial ointments keep indefinitely at room temperature and do not become rancid as does the home-made ointment. Case reports of the several types of lesions treated are reported, and it is pointed out that cod liver oil will not harm the most delicate tissues. It may be applied to the naked brain, the cornea, the exposed intestine and other tissues without fear of irritation or infection. The author reports the first cure with cod liver oil of a chronic undermining burrowing ulcer and 2 cases of complete rupture of an infected abdominal wound in which the oil was applied to the intestine. Cod liver oil is not offered as a panacea for all the evils of wound healing. Granulations often require trimming and the application of silver nitrate. At times a change from the oil to oxyquinoline scarlet R or bismuth violet ointment may be temporarily beneficial. Hot wet saline or boric acid compresses may be useful. The patient should always have the benefit of early skin grafting when necessary. General disease must be recognized and adequately treated. Hypoproteinemia must be prevented, the diet must be adequate and sufficient ascorbic acid intake is essential, while anemia must be prevented or the condition corrected.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

49:197-258 (April) 1941

- Appendicitis. C. E. Black, Jacksonville, Ill.—p. 197.
Surgery of Biliary Tract in County and Private Hospitals. C. A. Bachhuber, Los Angeles.—p. 203.
Treatment of Varicose Veins. S. H. Babington, Berkeley, Calif.—p. 208.
Auriculoventricular Block in Pregnancy. A. W. Diddle, Iowa City.—p. 220.
Maternal Mortality and Forceps. F. A. La Breck, Eau Claire, Wis.—p. 225.
Iodine Content of Normal Human Thyroid Gland and Its Correlated Histology. J. D. King and F. E. Hamilton, Columbus, Ohio.—p. 231.
Pregnancy and Syphilis: Résumé of Ten Years Work by the Los Angeles Maternity Service. B. J. Hanley and Lola Pedlow, Los Angeles.—p. 247.

49:259-308 (May) 1941

- Back Disabilities Due to Strain of Multifidus Muscle: Cases Treated by Novocain Injection. W. K. Livingston, Portland, Ore.—p. 259.
*Acute Pancreatitis: Thirty-Five Cases with Observations on Blood Amylase Studies. G. K. Rhodes, San Francisco.—p. 266.
Surgical Management of Chronic Duodenal Ulcer. C. T. Sturgeon, Los Angeles.—p. 271.
Problem of Common Duct Stone. J. H. Woolsey, Woodland, Calif.—p. 277.
Instrument for Retraction of Viscera During Peritoneoscopy. S. Robinson and L. G. Fiske, Santa Barbara, Calif.—p. 284.
A Family with Hemolytic Icterus. H. H. Searls, San Francisco.—p. 294.
Present Status of the Newer Urinary Antiseptics. H. A. R. Kreutzmann, San Francisco.—p. 299.
Proximal Y Anastomosis for Treatment of Jejunal Ulcers. M. E. Steinberg, Portland, Ore.—p. 301.

Acute Pancreatitis.—Clinical and experimental studies, according to Rhodes, suggest that several etiologic factors, singly or combined, produce acute pancreatitis. Its etiology in many instances is associated directly or indirectly with disease of the biliary tract. External trauma was the direct etiologic factor in 5 of the author's 35 patients. Severe pain is always present and usually develops from two to three hours after a heavy meal or follows overindulgence in alcohol. Vomiting is a prominent symptom and often precedes pain. Abdominal distention may develop early, and tenderness over the pancreas is the rule. Signs of peritonitis are most evident in the upper quadrants. Physical signs of shock, rapid pulse, lowered pressure and others probably result from the histamine-like protein absorption and are observed only in patients whose gland is extensively involved. Temperature varies from subnormal to a moderate rise. Hyperglycemia and glycosuria depend on the extent of damage to the gland. Diastase in the urine has been used as a diagnostic test, but blood amylase readings probably give more reliable data and are elevated earlier. The rise in blood amylase values is probably the result of absorption of secretions from the obstructed ducts or the absorption of disintegrated pancreatic tissues. Among more than 195 blood amylase determinations it was noticed that the determinations were of most value during the early onset of the disease and that they fluctuated widely within a few hours. After the first twenty-four hours the readings may temporarily be subnormal; it is advisable, therefore, to make frequent determinations. The test is of inestimable value in arriving at a diagnosis of acute pancreatitis. Prior to blood amylase studies the diagnosis was difficult. It was most often confused with perforated peptic ulcer, acute intestinal obstruction and acute cholecystitis. In most instances these errors can be avoided by routine roentgenograms which show pneumoperitoneum, a distended intestine and gallbladder visualization in the respective diseases. The author's experience with 35 patients suggests that during the acute stage of the disease conservatism is the procedure of choice. Most cases undergo spontaneous resolution, even as acute parotitis or acute salpingitis. Surgical intervention when the pathologic process is extensive, as in severe hemorrhagic pancreatitis with obvious surgical shock, is only a heroic gesture. A far better outcome is to be expected if the patient is treated conservatively with transfusions and supportive therapy. Many patients have thus survived the acute initial period and the process has resolved into an abscess or cyst, making the surgical problem relatively simple. At some future date any associated disease of the biliary tract should be eradicated as a prophylaxis against future attacks.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1:501-544 (April 5) 1941

Rehabilitation of the Injured. E. A. Nicoll.—p. 501.

*Pulmonary Concussion ("Blast"). G. R. Osborn.—p. 506.

Electroencephalography in Traumatic Intracranial Hemorrhage. L. Rogers.—p. 510.

Blood Concentrations Following Local Application of Sulfonamide Compounds to Wounds. F. Hawking and J. E. Piercy.—p. 511.

Pneumococcal Septicemia with Recovery. J. E. Murray and S. Oram.—p. 513.

Pulmonary Concussion.—Osborn compares cases of pulmonary concussion seen in civil life with those resulting from the detonation of high explosives. Among 94 necropsies of persons dying through road accidents there were 8 pulmonary lesions and 3 of these were comparable to bomb cases; these were in girls aged 4 and 8, and a boy of 7. The girl of 4 had been run over by a motor lorry, causing a fracture dislocation of the sixth and seventh cervical vertebrae. Her lungs showed multiple hemorrhages on the pleural surface; they were most numerous in the parts of the lungs which enter the phrenicocostal sinus of the pleura and posteriorly, but there was some rib marking on the lateral surfaces. The liver showed a small laceration of the posterior surface, and there were some peritoneal tears in the transverse colon. The girl of 8 had been knocked down by a motor car; she showed a little bruising over the left lower ribs but was otherwise unmarked. There was a profuse hemothorax from the left and a smaller one from the right side. There was a large tear near the hilus of the left lung, and contusions were scattered throughout both lungs. The liver was torn but the spleen was not. The boy of 7 was run over by a motor lorry. The trunk was not marked. The left lung showed a widespread hemorrhagic lesion about the hilus posteriorly, "rib markings" and a wedge-shaped contusion of the part in the phrenicocostal sinus. In the right lung there were innumerable pinpoint hemorrhages due to inhalation of blood from the left; the spleen showed superficial bruising. The other 5 pulmonary injuries were lacerations from fractured rib ends. The 3 cases in children with flexible chest walls were accompanied by abdominal injuries. Review of road and bomb cases emphasizes the point that there is an abdominal component to the force which produces the basal contusion of the lung. If this wedge-shaped lesion is present the question is not "Is the underlying spleen or liver damaged?" but "How severely is it damaged?" It may be a trivial bruise or a hopeless tear. Most war cases have come from bombed houses and shelters; pulmonary concussion appears to be infrequent in persons injured in an open bombed area. Pulmonary concussion should be looked for in every case from a bombed house. Factors which tend to minimize pulmonary concussion are advancing years, obesity, rigidity of the chest wall, the position of expiration and heavy clothing. So far too little attention has been paid to the fact that the abdomen is suddenly compressed as well as the thorax. Should operation be indicated the organ responsible for the abdominal hemorrhage is likely to be demonstrated by the side of the phrenicocostal sinus lesion. If this is placed posteriorly as well as laterally on the right side the tear in the liver will probably be inaccessible. Tears of the spleen are likely to be at the upper pole. Pulmonary concussion is not necessarily fatal. Death results from acute pulmonary edema and embolism. The latter may be prevented by regular active movements of the lower limbs aided by raising the foot of the bed to prevent hemostasis and by avoiding dehydration and other causes of hemoconcentration. Probably the most important act in treating hemorrhagic concussion of the lungs is to anticipate and prevent pulmonary edema and embolism. Knowledge that the case has occurred in a confined space will help the clinician if he keeps in mind that these patients are prone to suffer from carbon monoxide poisoning (Hadfield and his colleagues). The state of the patient is of greater importance than the size of the bomb or the distance from it. Knowledge of the details of the bomb may be misleading. In houses the positive pressure cannot fall until the walls and the roof are blown open.

Lancet, London

1:471-498 (April 12) 1941

*Wounds of Knee Joint. W. H. Ogilvie.—p. 471.

Idiopathic and Traumatic Narcolepsy. A. W. Gill.—p. 474.

Action of Eserine and Prostigmine on Epileptic Cerebral Discharges.

D. Williams and W. R. Russell.—p. 476.

Meningitis with Nasal Disease Due to Streptococcus Viridans. D. R.

Cameron.—p. 479.

Hodgkin's Disease in Bladder. R. Phillips.—p. 480.

Staphylococcal Osteomyelitis of Spine. E. C. B. Butler, I. N. Blusger

and K. M. A. Perry.—p. 480.

1:499-528 (April 19) 1941

The Modern Troglodyte. Horder.—p. 499.

Fat Embolism. R. A. Rowlands and C. P. G. Wakeley.—p. 502.

Evipan Hypnosis in Psychiatric Outpatients. E. Stungo.—p. 507.

Wounds of Knee Joint.—According to Ogilvie, immobilization of an injured knee until infection has been averted or overcome is the key to successful treatment. In a forward area local treatment is limited to cleansing the skin, applying an abundant sterile dressing and immobilizing the limb for transport. A prophylactic dose of sulfanilamide should be given if possible. Every wound of the knee joint is an urgent case; the most important cases are those seen within the "preinfective" or "grace" period of six hours. Through and through bullet wounds with punctured entry and exit holes do not usually require operation; wounds the result of low velocity projectiles often come in the same category. At time of stress these can be evacuated farther, temporary immobilization being replaced by something efficient and prophylactic sulfanilamide continued. These patients must be watched carefully; the joint must be aspirated if it gets at all tense, and immobilization must be continued until infection is overcome. The early motion of injured joints is as unsound as that of fractures. Most penetrating wounds of the knee joint and all those with injury to the patella or partial injury to the other bones should be operated on. Operation should be done under a tourniquet with the strictest aseptic precautions. Local injuries to bone are treated as radically as possible. A patella splintered by a projectile should usually be removed completely. Holes in the femoral condyles or the articular surface of the tibia may be scraped with a curet or trimmed with a small gouge until they are smooth cavities lined with apparently healthy bone. After excision, suture or partial suture should be attempted. The skin may be closed with interrupted sutures in favorable cases, but if one is in doubt it is better to pack the outer layers of the wound with petrolatum gauze down to the synovial membrane. The only apparatus that gives 100 per cent immobilization of the knee is a plaster spica. Sulfanilamide should be given for a full four days. Dressings are left alone for at least ten days. If evacuation is imperative before this, the surface stitches should be removed and the cutaneous wound packed lightly and left open. Complete fractures of the tibia or femur, seen within six hours of injury, demand primary amputation. After twenty-four hours bacteria have established their entry and the tissues their defenses. The time for débridement is past and the alternatives are expectancy or drainage. The wise policy is to continue immobilization and sulfanilamide, watch the condition of the patient and the wound, aspirate the joint if need be, and be ready to drain or to cut down on a foreign body. As soon as septic infection has been recognized, the knee should be drained, the drainage incisions packed with petrolatum gauze and the whole limb (including the foot and pelvis) immobilized in a closed plaster hip spica. If the infection is overcome within four days the joint is saved, as the cartilage has not been affected; if not, joint and cartilage are lost. If all goes well, the cast should be left undisturbed for at least three weeks; if the patient is not better at the end of four days it is best to amputate the leg. Only complete immobilization will insure success. Changes of plaster casts because of offensive discharge can usually be obviated by fluffed gauze applied over the petrolatum packs and covered by one or two layers of wool firmly bandaged. The cast should be so constructed that its strongest strut is away from the wound. These measures will protect the plaster and, if the rest of the cast is unpadded, will not interfere with immobilization.

Schweizerische medizinische Wochenschrift, Basel

71:149-168 (Feb. 15) 1941

Physiopathology of Asthmatic Crises. A. Epstein.—p. 149.

Osteochondritis Deformans Juvenilis. F. Jakob.—p. 152.

*New Data on Vitamin P. V. Vacek.—p. 155.

Sulfathiazole in Treatment of Swine Erysipelas in Man (Erysipeloid). G. Peyer.—p. 159.

Treatment of Reinfected Tuberculous Fistulas: Case. M. Wasserfallen. p. 159.

Vitamin P.—Vacek studied the effect of vitamin P on capillary resistance, blood clotting time and thrombopenia in a limited number of patients and controls. Capillary permeability was determined in normal subjects with reduced capillary resistance and in persons with hemorrhagic diathesis both before and after injection. Twenty milligrams of a vitamin P preparation was intravenously administered and its effects were noted at intervals of thirty, sixty, one hundred and twenty and one hundred and eighty minutes. The author found that capillary resistance was considerably reduced. Maximal effects were seen in 4 cases after one hour, in 2 after thirty minutes and in 1 case after two hours. The effects wore off after three hours. Blood coagulation time was studied in subjects with normal or slightly protracted clotting times. Vitamin P was seen to accelerate the beginning and termination of coagulation and thus to curtail, on an average, the clotting time by from 20 to 30 per cent. Its effects lasted four hours. No significant effect was observed on the thrombocytic count or on bleeding time in normal subjects. In two cases of purpura haemorrhagica, vitamin P was able to control at least the manifestation of the disease and enable the patient to weather the acute attacks. Two subjects with ulcerative colitis were greatly improved by abundant use of the vitamin. Its therapeutic value was also seen in cases of gingivitis. The author does not attempt to explain the pharmacodynamic mechanism of vitamin P except to note that its effect does not depend on the number of blood platelets. He found that in controls with a normal thrombocytic count petechiae developed when tests for capillary fragility were made before the injection of vitamin. In thrombopenic subjects, while vitamin P did not increase the blood platelets, petechial manifestations either disappeared or did not occur. Vitamin P may, however, influence the blood platelets by strengthening their functional energy.

Giornale Ital. di Dermatologia & Sifilologia, Milan

81:925-1152 (Dec.) 1940. Partial Index

*Bactericidal Power of Blood in Course of Staphylococcus Toxoid Treatment. A. Coppolino.—p. 969.

Staphylococcus Toxoid Therapy.—Coppolino made determinations of the bactericidal quality of the blood of 10 patients with staphylococcal infections of the skin before, during and after inoculation with staphylococcus toxoid. Toxoid diluted in the proportion of 1 to 10 parts of physiologic solution of sodium chloride was administered in doses of 0.2, 0.4, 0.6, 0.8 and 1 cc. of the solution. The injections were given at intervals of three or four days. Failure of the first series of injections occurred rarely and only in cases of acute involvement. It was followed by administration of a second series in which undiluted toxoid was used. The studies concerned *Staphylococcus aureus* of only one strain the virulence of which had previously been determined. The blood was withdrawn when the patients had no fever. The Jannsen-Cator method in which citrated blood is used was resorted to in determining the bactericidal power of the blood. The author found that toxoid therapy stimulates production of antitoxins with consequent increase in the bactericidal quality of the blood which is paralleled by clinical improvement. The immunity depends on the dose of toxoid administered in relation to the number of bacteria in the blood. Moderate infection is controlled with diluted toxoid. Undiluted toxoid is indicated in cases of acute involvement in which the bactericidal power of the blood does not change in the course of or after diluted toxoid therapy. An increase in the bactericidal power of the blood in the course of toxoid treatment suggests a good prognosis. The treatment is well tolerated and does not cause local or general untoward reactions.

Revista Mex. de Cir., Ginec. y Cancer, Mexico City

9:39-80 (Feb.) 1941. Partial Index

*Blood Transfusion in Puerperal Infection. J. Camarillo.—p. 39.

Blood Transfusion in Puerperal Infection.—According to Camarillo a single blood transfusion in the amount of 100 or 150 cc., administered early in the course of puerperal infection, in association with sulfanilamide controls the infection. Sulfanilamide alone may fail. Transfusion is administered directly from the donor in amounts of 3 cc., with brief interruptions, until 30 cc. of blood has been transfused, after which 10 cc. is given and repeated at brief intervals until 100 or 150 cc. has been transfused. Transfused blood has hiohyllactic properties by means of which the infection is controlled. The technic is simple and the equipment within reach of all physicians. The author obtained gratifying results from the combined treatment in the maternity department of the General Hospital of Puebla City.

Deutsches Archiv für klinische Medizin, Berlin

186:225-328 (May 6) 1940

Observations on Orthostatic Coronary Insufficiency and Its Nosologic Position. H. Lauer.—p. 225.

Investigations on Normal Form of Electrocardiogram in Lead from Left Leg to Absolute Cardiac Dulness. H. Mössner.—p. 241.

Investigations on Experimentally Produced Purpura. A. Heymer, J. Hermkes, W. Pfeiffer and J. Spitzer.—p. 258.

Morphologic Observations on Reticulum of Hemopoietic Tissue. W. Tischendorf and A. Frank.—p. 272.

Thoracic Pulsations Accompanying Heart Action. G. Landes.—p. 288.

*Clinical Contribution to Stenosis of Aortic Arch. H. Franke.—p. 304.

Stenosis of Aortic Arch.—Frankc defines as stenosis of the aortic isthmus constriction of that part of the aorta located between the branching off of the left subclavian artery and the junction of the ductus arteriosus botalli. The three recognized forms of isthmus stenosis are (1) the typical isthmus stenosis at the orifice of the ductus arteriosus botalli, (2) the isthmus stenosis above and (3) the isthmus stenosis below this orifice. Exact localization is generally not possible during life. Stenosis of the aortic isthmus is rare (0.8 per thousand at necropsies) and stenosis of the aortic arch is extremely rare. The world literature contains reports of only 5 such cases. In this extremely rare type the stenosis is in the arch of the aorta between the branching off of the innominate artery on the one hand and the left common carotid and the left subclavian arteries on the other. The authors recently observed a patient in whom they were able to diagnose stenosis of the aortic arch during life. The high blood pressure in the right arm with great amplitude and pulsus celer et altus in the right radial artery, contrasted with reduced blood pressure in the left arm and the lower extremities with a pulsus parvus and tardus, suggested a mechanical obstacle between these two vascular spheres. Syphilitic genesis of the stenosis could be excluded. There were time differences between the left and the right radial pulse, and the left arm was colder than the right. The main blood stream passed through the greatly dilated innominate artery. The right common carotid artery showed forcible pulsation in contradistinction to the left, which was extremely thin. Even the retinal vessels showed differences in blood perfusion. Percussion disclosed hypertrophy of the left side of the heart. A loud and palpable systolic sound was transmitted into the right carotid and into the right subclavian arteries and often prevented sleep. Persistent right-sided headaches and the development of general signs of intracranial pressure, such as choked disk, increased spinal fluid pressure and bradycardia, suggested a space-consuming process in the cranial cavity. The sudden development of visual disturbances, spastic paralysis of the left leg and a tendency to clownish jokes suggested a frontal brain lesion, probably a cerebral aneurysm, a frequent complication of isthmus stenosis. Diagnosis of stenosis of the aortic arch was corroborated by roentgenologic signs. In the oblique diameters the arch appeared extremely narrow. Dilatation of the right common carotid artery and of the innominate arteries produced displacement of the trachea to the left. The heart, particularly the left ventricle, showed dilatation. Necropsy revealed an aorta with a small diameter throughout and particularly narrow between the innominate and the left common carotid arteries. Necropsy also revealed a cerebral aneurysm and aneurysmatic dilatation of the coronary arteries.

Klinische Wochenschrift, Berlin

19:457-488 (May 18) 1940

- New Opinions About Regulation of Respiration. T. Benzinger.—p. 457.
 Bound Ascorbic Acid in Plants. P. Holtz and C. Reichel.—p. 461.
 Catamnestic Data on Patients with Diabetes Mellitus Treated at Rostock Clinic During Last Ten Years. O. Laur and F. Meythaler.—p. 463.
 Hydrochloric Acid-Collargol Reaction as Diagnostic Aid in Cerebrospinal Fluid Specimen Contains Blood. Annelene Kröger.—p. 468.
 *Experiences with Protamine Zinc Insulin and Depot Insulin of Bayer. R. Schramm.—p. 470.
 Toxicology of 4,4-Dioxy-Alpha, Beta-Diethyl Stilbene. H. Kreitmair and W. Sieckmann.—p. 474.
 Does Blood Platelet Count Decrease in the Aged? A. Heymer and G. Ottowess.—p. 478.
 Shortening of Coagulation Time of Blood by Means of Oxalate. H. Druckrey and R. von Goedel.—p. 480.

Protamine Zinc Insulin and a New Depot Insulin.—

Schramm states that recently a new method has been developed in preparing a so-called native insulin isolated from the insular apparatus of fresh pancreas which is reported to exert depot-like action without any addition of proteins. The active constituent of this "depot insulin" is a complex which has a protracted blood sugar-decreasing effect. It is the physiologic storage form of the pancreatic hormone in the organism, which is slowly changed into the active form; this makes the depot action of this so-called native insulin understandable. The author made clinical experiments to determine whether this insulin produces the same therapeutic results as does protamine zinc insulin. He found in a group of 80 cases that the same effects can be produced with the depot insulin as with protamine zinc insulin. It was possible to give the two in the same doses in equally severe cases and with the same time arrangement of carbohydrate feedings. The depot insulin has the added advantage in that it contains no protein. The cutaneous reactions are not more frequent and the effect on the blood sugar not inferior to that of protamine zinc insulin. The administration of large doses is possible in some cases but is not successful in all cases of severe diabetes. In a few cases it was possible to compare the actions of protamine zinc insulin and the depot insulin with that of an older form of depot insulin. The first two always proved superior, particularly as regards the distribution of carbohydrates, because they do not require a crowding together of the carbohydrate foods and thus permit greater freedom in the diet. The author reasons that it should be possible to begin insulin therapy with depot insulin, but so far he has accomplished this in only a few cases. For the patient, the immediate treatment with depot insulin would be an advantage because hospitalization could be shortened and the difficulties of transition from one type of insulin to another could be done away with.

Monatsschrift für Kinderheilkunde, Berlin

82:283-430 (April 22) 1940. Partial Index

- *Simultaneous Appearance of Abacterial Meningitis and Encephalomyelitis or Encephalomyelomeningitis. H. G. Huber.—p. 283.
 Studies on Vaccination: Role of Reaction Capacity of Organism in Smallpox Vaccination. D. Gyüre.—p. 304.
 Pemphigus Acutus Febrilis in Infants: Report of Four Cases. Helene Sonnemann.—p. 323.
 Bacteriology and Immunobiology of Pneumonias in Relation to the Results of Clinical and Immunobiologic Research. Joppich.—p. 329.
 Importance of Carbon Dioxide for Forms of Blood Calcium. G. O. Harnapp.—p. 341.
 Importance of Anorganic Phosphate for Forms of Biologic Calcium. G. O. Harnapp.—p. 352.

Abacterial Meningitis and Encephalomyelitis.—Huber reports the clinical histories of 11 children aged 2 to 11 years who presented disturbances that must be regarded as manifestations of acute infectious encephalitis of an unknown causal agent. Some of the children presented aspects of so-called idiopathic aseptic meningitis; in others the meningitic symptoms were subordinated to encephalitic symptoms, and 1 child manifested signs of encephalomyelomeningitis. Simultaneously with these disorders in the central nervous system, serous meningitis was observed with increased frequency in adults between the ages of 18 and 35. In all the adults the disease took a favorable course, but 2 of the 11 children died. This indicates that, although the acute infectious encephalomyelitis usually pursues a benign course, it does not always end as favorably as is generally believed. The observations further indicate that

the so-called idiopathic aseptic meningitis may be associated with acute encephalitis and that some cases regarded as acute aseptic meningitis *sui generis* probably should be interpreted as manifestations of acute infectious encephalitis.

Wiener medizinische Wochenschrift, Vienna

90:995-1028 (Dec. 28) 1940

- Diagnostic Aspects of Postoperative Peptic Ulcer. R. Paolucci.—p. 995.
 *Electric Shock Therapy. H. Cerletti.—p. 1000.
 Therapy in Cases of Severe Cardiac Decompensation. C. Gamma.—p. 1006.
 *Diagnosis of Primary Cancer of Head of Pancreas. A. Gasbarrini.—p. 1009.
 Scoliotic Sciatica as Reflex in Protrusion of Intervertebral Disk. V. Putti.—p. 1016.

Electric Shock Therapy.—Cerletti reviews the status of the electric shock therapy of mental disorders. Experiments with different species of animals (dogs, cats, hogs) induced him to try the procedure on human subjects. He learned that it is much less dangerous to pass the electric current through the brain than through the trunk, because in the latter passage the heart is affected. His aim was to find a substitute for the metrazol shock therapy of schizophrenia. Convulsions are elicited with a current voltage of from 70 to 110 (300 to 600 milliamperes). The majority of investigators agree that this voltage is best, but some have employed voltages up to 150. The author passes the current for one tenth of a second, though some investigators pass it for longer periods. The variations in voltage and time indicate that the method has wide limits of tolerance. The number of convulsions necessary to obtain a therapeutic result varies greatly, depending on the type of disease and the individual case. In cases of melancholia and manic depressive psychosis complete recovery has been obtained by from four to six applications. The treatment must not be terminated too early. At the author's clinic the electric shock treatment is usually applied two or three times a week; in other clinics it is given more frequently. Comparisons with the insulin shock therapy revealed that the electric shock therapy is preferable in all mental disturbances accompanied by depression, especially in those patients with psychomotor inhibition or retardation. The author employs it in the majority of patients with schizophrenia. Insulin shock is preferable in patients who are in a state of psychomotor excitation and who are emaciated. In schizophrenia and in manic depressive psychosis recurrences are likely and treatment should be repeated as soon as signs of relapse appear. Braunnühl suggested that in mental disorders of a periodic nature the electric shock therapy be repeated from time to time in order to prevent recurrences.

Diagnosis of Primary Carcinoma of Head of Pancreas.—According to Gasbarrini, primary carcinoma of the head of the pancreas has no characteristic symptomatology. The pain is not intense during the early stage but later may become so severe as to direct attention to the pancreas. The pain is pressing or lancinating and is most frequently located in the epigastric and the umbilical region. The pain may be crisis-like in the beginning and may simulate biliary colic with radiation toward the right shoulder. It may radiate into the lumbar region and toward the left shoulder. Gastrointestinal disturbances are frequent. The patient complains of a feeling of fullness in the epigastrium; he loses his appetite, and an aversion to fats develops. There may be heartburn, nausea, crutation and vomiting. Some patients have a characteristic postprandial borborygmus. There may be intestinal disturbances such as constipation or diarrhea, with an increase in the quantity of feces as the result of deficient digestion and absorption. Fever may be absent or remittent. Cachexia is definitely pronounced. Icterus develops in 90 per cent of the cases. Distention of the gallbladder is of considerable diagnostic significance. The author does not agree with Bard and Pic that the liver is always contracted in carcinoma of the head of the pancreas. The spleen is rarely enlarged as long as there is no obstruction in the region of the portal vein. The pancreatic tumor is rarely palpable, but a resistance in the epigastrium is perceptible. Palpation is often made difficult by ascites, meteorism or tenseness of the abdominal wall. As has been urged by Riva and by Zoja, the abdominal wall. As has been urged by Riva and by Zoja, palpation should be done on the fasting patient, when the diges-

tive tract is empty and while the patient is completely relaxed in a warm bath. Roentgenologic examination is valuable. Although the pancreas itself is difficult to visualize, indirect symptoms, which indicate an enlargement of the pancreas, are important. The lesser curvature of the stomach, the antrum and the pylorus show abnormal outlines. The duodenum may show stenosis, lateral deviation, lengthening or the still more characteristic C shape. The transverse colon likewise may exhibit symptoms of deviation and compression. Icterus may be followed by symptoms of compression of the portal vein (ascites) or of the vena cava (edema of the lower extremities, the genitalia, the abdominal wall). Functional disturbances of the digestive tract are frequent and are most important for the diagnosis. Steatorrhea is frequent. The fatty stools contain large quantities of neutral fats and fatty acids but few saponins. The study of the digestive process and of fat elimination permits an estimation of the severity of the pancreatic damage. Tolerance tests with fat may reveal the closure of the pancreatic duct in cases of primary carcinoma of the head of the pancreas. The endocrine disturbances characteristic for diabetes mellitus are rare in pancreatic cancer; however, glycosuria, particularly if it is transitory, may be of considerable importance. Lack of indican is of no particular significance. The differential diagnosis must consider stone in the common duct, chronic pancreatitis with icterus, pancreatic calculi, pancreatic cysts and primary carcinoma of the duodenum, of the ampulla of Vater or of the choledochus. The prognosis of primary carcinoma of the head of the pancreas is unfavorable; the course is comparatively rapid. Surgical treatment has proved ineffective even if employed during the initial stage.

Zeitschrift f. d. ges. Neurol. u. Psychiatrie, Berlin

169:471-606 (May 22) 1940. Partial Index

- *Theory and Practical Evaluation of Colloidal Gold Reactions. F. Duensing.—p. 471.
Significance of a Certain Type of Encephalographic Ventricle Picture. J. Hempel.—p. 522.
Cerebral Influence on Vegetative Nutritional Rhythm. H. Regelsberger.—p. 532.
"Endocrine-Vegetative" Attacks and Their Relation to Hereditary Epilepsy. J. Schottky.—p. 543.

Colloidal Gold Tests.—Duensing sought to determine the precipitating agent in the colloidal gold reaction by investigating the albumin and globulin fractions in both normal and pathologic spinal fluids. His conclusion is that the precipitation is due to the globulins found in the pathologic fluid and that the difference in spinal fluid findings observed in different nervous diseases may be due to the passage of varying amounts of serum albumins into the cerebrospinal fluid. He enhanced the normal albumin levels by ultrafiltration so that they reached the levels found in the spinal fluid of subjects affected with paralysis, multiple sclerosis and meningitis only to discover that the precipitating effect was negative. This seemed to indicate that considerable qualitative differences exist between the albumins in normal and in pathologic spinal fluids. Examination of the globulin fraction of normal spinal fluid by means of a special (described) method demonstrated that globulins of normal fluid possessed either no coloring power or only an inconsiderable one. It appeared that neither the low albumin content nor the relatively low globulin content in the normal fluid is responsible for the negative colloidal reaction but that the globulins of normal spinal fluid possess some special properties which are either incapable of reacting to colloidal gold or can do so in only a very limited way. On the other hand, the precipitating effect of pathologic fluid was found to be due not to larger concentrations of albumins than are found in normal fluid but to the presence of globulins possessing other colloidal-chemical qualities. However, no disease specificity can be ascribed to globulins since the globulin fraction presented the same characteristics for diseases etiologically different and considerable qualitative variation could be observed in the globulins in different cases of the same disease. Transitional phases of all kinds were observed to exist from nonprecipitating globulins of normal spinal fluid to precipitations of greatest strength found in paralytic fluid. This difference in precipitation is due to the degree of dispersity; globulins which induce a weak precipitation seem to possess a

finer dispersity. The albumins in the spinal fluid in cases of diseases of the brain and spinal marrow may be derived, he believes, from the blood serum with the aid of the meninges and the mechanism responsible for the secretion of the cerebrospinal fluid.

Kekkaku, Tokyo

19:1-58 (Jan.) 1941. Partial Index

- *Studies on the Nature of the Antigen in Complement Fixation Reaction of Tuberculous Serum. S. Kawakami.—p. 1.
*Studies on Nucleinemia. S. Mori.—p. 50.

Tuberculous Antigen in Complement Fixation.—One of the advantages in the performance of the Kogami-Kawakami complement fixation test in tuberculosis, according to Kawakami, is the uniformity in the antigenic activity of the antibodies prepared by the adsorption technic. The antigenicity of the material prepared from tubercle bacilli was found to be approximately the same whether the organisms were grown in Long's synthetic medium or in ordinary glycerin-bouillon medium. Moreover, by the adsorption technic the antigenic property may be unified irrespective of either the strain of the organisms or the medium employed for their culture. In other words, the nature of the tuberculous antigen is influenced by the autoinhibitory substances, and an antigen of uniform activity can be prepared by reducing the inhibitory factor to its minimum level. For the complement fixation reaction the maximum antigenic activity of the tubercle bacilli can be obtained from a culture grown for six weeks or longer on glycerin-bouillon medium. It was found too that lowering of the hydrogen ion concentration (acid reaction) reduces the inhibitory power of the antigen prepared from the dried and powdered bacilli. When the antigens obtained from the bacilli grown on Long's synthetic medium and on 4 per cent glycerin-bouillon were compared by the complement fixation method in 118 serums of tuberculous patients, the former gave 68.6 per cent and the latter 88.1 per cent positive reactions. When the inhibitory factors were eliminated by the adsorption technic, the antigens prepared from the two culture methods gave exactly identical results (91.5 per cent positive). The inhibitory factors present in the antigens can be completely removed by repeated washing with distilled water and by heat desiccation.

Nucleinemia and Erythrocyte Sedimentation.—Thymonucleic acid, a tetranucleotide, is an electrolyte of great molecular weight whose reactions within the living cell with protein, amino acids, ammonium, sodium and hydrogen control such phenomena as the nuclear osmotic pressure, Donnan's equilibria, water metabolism and nuclear morphology. When the nucleotide or its compounds escape into the blood in abnormal amounts the condition is designated as nucleinemia. Mori believes that nucleinemia is one of the conditions that cause the acceleration of erythrocyte sedimentation rate, and therefore the simple qualitative ring test for the thymonucleic acid level of the plasma offers a convenient method of ascertaining the activity of any disease in which erythrocytic sedimentation is increased. The ring test that the author devised is based on the nucleic reaction of Feulgen (1917), which is the color reaction produced by Schiff's reagent after the hydrolysis of thymonucleic acid. The test is conducted as follows: Exactly 0.2 cc. of either hemolysis-free serum or plasma is mixed with 0.1 cc. of 15 per cent sulfuric acid and heated in a water bath at 80 C. for five minutes. After cooling under the tap, 0.1 cc. of twice normal sodium hydroxide solution is added and the mixture kept at ice box temperature for twenty minutes; after the contents are transferred into a clean small tube, approximately 1 cc. of fuchsin-sulfite reagent is poured on gently to overlay the hydrolyzed serum. After thirty minutes in the refrigerator a violet ring appears at the junction of the two fluids; the density of the color is proportional to the concentration of the thymonucleic acid content of the serum. The author produced necrosis of the tissue in rabbits by subcutaneous injection of 20 cc. of 10 per cent solution of sodium chloride and found that the nucleic acid content of the blood of treated animals roughly parallels the degree of necrosis in the tissue cells. Within thirty minutes after its intravenous injection, the blood concentration of thymonucleic acid begins to lower until, within two hours, it reaches a normal level.

Vrachebnoe Delo, Kharkov

22:401-480 (No. 6) 1940. Partial Index

- *Question of Universal Donor. V. N. Shamov.—p. 403.
Isohemoagglutinating Properties of Placental Blood. P. M. Rosenberg.—p. 409.
Hemolytic Shock. S. V. Polikarpov.—p. 411.
Symptomatology and Therapy of Frostbites. S. S. Girgolav and T. Ya. Aryev.—p. 415

Universal Donor.—The question of safety of blood transfusion from universal donors is of immense importance for emergency surgery and still more so for military surgery, according to Shamov. Levine and Mabee, Freeman and Whitehouse, Landsteiner and Coca in the United States and Küttner, Schiff and Wildegans in Germany consider this procedure hazardous and counsel against it. In support of their contention these authors cite statistics as to reactions following such transfusion. The author points out that this view is far from being unanimous. Thus, Tzanck in France, Brines in the United States, Moureau in Belgium and Spasokukotsiy and the author in the Soviet Union do not share this view. The author's own statistics from the Kharkov Institute for Blood Transfusion show that in a series of 1,143 transfusions among compatible groups there were 10 per cent severe and 30.7 per cent mild reactions, while in a series of 688 transfusions of blood from universal donors there were 13 per cent severe and 22.1 per cent mild reactions, not a significant difference. The Leningrad Institute for Blood Transfusions, now under the direction of the author, reports a series of eighty-five transfusions from universal donors with 14.1 per cent of mild, 9.4 per cent of moderately severe and 2.3 per cent of severe reactions. The incidence of reactions from transfusion of compatible blood was about the same. The objection raised against the use of the blood of universal donors is the presence of agglutinins α and β in their serum. It is argued that, if this titer is high and the recipient is very anemic, agglutination of red cells of the recipient and hemolysis might take place. The author points out that this so-called reversed agglutination cannot explain reactions taking place after transfusions of such small quantities of blood as 3, 5, 20 or 50 cc. He also points to Moureau's experience in giving 8 persons transfusions with blood from universal donors in amounts as high as 650 cc., the donors' blood containing a titer of from $\frac{1}{16}$ to $\frac{1}{102}$ against agglutinin α without any complication being noted. Samples of blood taken from the vein of the opposite side of the recipient in the course of the transfusion did not contain a trace of these agglutinins. The author believes that there exists some special mechanism for neutralization of the agglutinins besides the mere factor of dilution of the transfused blood. This mechanism may be found in the mass of agglutinogens contained not only in the erythrocytes but also in the plasma and the viscera of the recipient. The author concludes that transfusion of blood from universal donors is not associated with greater hazards than that of compatible blood. The acceptance of this opinion should be of importance to the solution of the problem of transfusion in the field of military action.

Nordisk Medicin, Stockholm

9:81-162 (Jan. 11) 1941. Partial Index

Hospitalstidende

- *Hyperparathyroidism: Two Cases Treated Operatively with Remarks on Geographic Distribution. H. E. Nielsen and K. Steffensen.—p. 115.

Hyperparathyroidism.—In the first of Nielsen and Steffensen's 2 cases of hyperparathyroidism due to adenoma, in women aged 57 and 43 respectively, with onset of symptoms at 48 and 40, the combination of renal calculus and calcium atrophy together with rheumatic-like pain in the extremities suggested the parathyroid disorder, while in the second case admission for treatment because of spontaneous fractures led to the diagnosis. In the first instance psychic changes were seen, manifested by alterations in character. In both cases roentgen examination showed osteomalacia and cyst formation. There were hypercalcemia and hypophosphatemia in the first case, considerable increase in the blood phosphatase in both cases. Complete recovery occurred in both cases after removal of the adenomas. In 1 case the postoperative course was complicated by a tetany

of brief duration, in the other the absence of tetany is attributed to prophylactic treatment with dihydrotachysterol. Examination of the blood phosphatase is especially helpful in cases of hyperparathyroidism of long standing with changes in the bones, since osteitis fibrosa-like changes accompanied by normal serum phosphatase exclude hyperparathyroidism; hypercalcemia is particularly significant in diagnosis in the earlier stages of the disease. They state that about 200 cases of hyperparathyroidism have been reported, 14 of these (including 13 with established adenomas) from Denmark. Adenoma formation is assumed to depend on certain embryonal cells with the power of adenoma formation, which are rarely found in the parathyroid glands and then usually in one gland. The lack of vitamin D or ultraviolet rays is believed to stimulate the parathyroid apparatus with resulting proliferation of these cells and so adenoma formation. The embryonal cells in question are thought to be present equally often in different localities, but adenoma formation occurs more often where there is greater stimulation.

9:163-242 (Jan. 18) 1941. Partial Index

- Observations Concerning Effect of Sulfonamide and Sulfapyridine Preparations on Pulmonary Tuberculosis. K. A. Vannfält.—p. 163.
*New and Specific Cutaneous Reaction in Boeck's Sarcoid; Preliminary Report. A. Kveim.—p. 169.

New and Specific Cutaneous Reaction in Boeck's Sarcoid.—Kveim found that in patients with sarcoid of Boeck a nodelike thickening of the skin appeared in the course of from one to several weeks after intracutaneous injection of a sterile extract of sarcoid tissue (from gland or skin nodules). The nodule remained for from weeks to months and its microscopic structure was often not to be distinguished from that of spontaneously originated sarcoid nodes. He regards this as a specific reaction of allergic type, since it did not occur in the control cases of lupus and syphilis, and injection with Frey's antigen caused no reaction in patients with Boeck's sarcoid. In his opinion the establishment of this specific cutaneous reaction supports the view that sarcoid of Boeck is a distinct entity.

Ugeskrift for Læger, Copenhagen

103:159-196 (Feb. 6) 1941

- *Death from Procaine Hydrochloride, in Connection with Infiltration of Procaine Hydrochloride into the Stellate Ganglion. J. L. Hansen.—p. 159.

Death from Procaine Hydrochloride.—In Hansen's case, in a woman aged 62 with a history of severe bronchial asthma for sixteen years, resistant to treatment, extirpation of the stellate ganglion was contemplated. Preliminary infiltration of the ganglion by injection by the posterior route of from 20 to 80 cc. of a 1 per cent solution of procaine hydrochloride without epinephrine was done five times in the course of twenty days, each injection being given during an attack of asthma, with excellent results. Intravascular injection was guarded against by aspiration tests. On the sixth infiltration 25 cc. (about 0.35 Gm. of procaine hydrochloride) was injected in the usual manner. In the first five minutes the respiration became completely free, then respiratory paralysis set in and in spite of immediate treatment with nikethamide and intracardiac injection of digitalis, together with artificial respiration and careful massage of the heart, death occurred within ten minutes after the injection. Chemical analysis showed that only the pure substance had been used. The author says that in this case, as in most published cases of fatal procaine intoxication, the actual cause of death was not clear, but the primary cause here was probably the infiltration of procaine around the stellate ganglion. He believes that of the factors which may play a part in death from procaine hydrochloride the following, either singly or in combination, may have contributed in this instance: (a) faster resorption than usual, (b) influence on the vagus, (c) cerebral anemia due to perivascular injection, (d) transport along the nerves to important centers, eventually on the basis of endoneurial injection, and (e) reduction of the procaine-eliminating ability of the liver. He urges further investigation on deaths following injections of procaine hydrochloride and the publication of cases which are fatal. He does not warn against blocking of the sympathetic but emphasizes that the procedure calls for strict indications and careful consideration.

Book Notices

Psychotherapy: Treatment That Attempts to Improve the Condition of a Human Being by Means of Influences That Are Brought to Bear Upon His Mind. By Lewellys F. Barker, M.D., Visiting Physician, Johns Hopkins Hospital, Baltimore. Cloth. Price, \$2. Pp. 218. New York & London: D. Appleton-Century Company, Incorporated, 1940.

"Treatment that attempts to improve the condition of a human being by means of influences that are brought to bear upon his mind." The promise of a broad and eclectic point of view given by this definition is borne out by Barker's book on psychotherapy. The treatise is not a lengthy one. There are nine chapters, a glossary, a bibliography and an index. The first chapter contributes several adequate descriptive definitions of psychotherapy. The second chapter recounts and describes the steps that are necessary in order to arrive at diagnostic shaping conclusions; the third indicates how the acquired information may be utilized in forging effective psychotherapeutic weapons; the fourth chapter suggests the particular trends that may be imparted to psychotherapy by reason of a scrutiny of heredity and environment. The fifth chapter discusses in fifty-one pages more than fifteen methods of psychotherapy. The chapter reveals both the assets and the defects of Barker's contribution. About a half of these discussions, though quite brief, are nevertheless stimulating enough to excite further interest and study. However, whenever conclusions are given there is the danger of inviting misinterpretation and misconception resulting from inadequacy of discussion. For instance, the remarks concerning psychotherapy in alcoholism do not give any indication concerning the considerable progress which has been made in the identification and understanding of alcohol habituation as a psychoneurosis resulting from emotional immaturity determined in childhood. A short chapter on the psychotherapy of so-called organic diseases emphasizes the psychotherapeutic significance of the now commonly accepted doctrine of the fundamental unity of man; the entwining of physical and psychic; the constant interchange between structural and emotional reactions. The seventh and eighth chapters focus on psychotherapy from the angles of the particular psychoneurosis or psychosis which is the target of the therapy and the life epoch in which there occur the problems which psychotherapy attempts to solve. The glossary will be helpful in giving the student a quicker understanding of the subject matter. The bibliography constitutes an excellent reading list. In the final chapter the author gives a glimpse of the fascinating vistas of the therapy which may be unfolded in the future. The author is inclined to believe that "a part of psychotherapy in the future" may "be compelled to give way to new forms of chemotherapy."

Let us hope that there will be not a displacement of one by the other but rather a mutual and deeper understanding, so that both psychic and chemical technics become increasingly effective and the frontal attack on the pathologic defenses of human maladjustments becomes more and more successful.

A Short Practice of Surgery. By Hamilton Bailey, F.R.C.S., Surgeon, Royal Northern Hospital, London, and R. J. McNeill Love, M.S., F.R.C.S., Surgeon, Royal Northern and Metropolitan Hospitals, London. Fifth edition. Cloth. Price, 30s. Pp. 1,015, with 880 illustrations. London: H. K. Lewis & Co., Ltd., 1941.

This is the fifth edition of this book over a period of nine years. At first glance this may appear to be an excessive number of revisions, but comparison with a popular American textbook reveals that this volume had been revised the same number of times over the past decade. These frequent editions are indicative of the rapid changes in the science of surgery, but they also indicate the difficulty of fitting a modern textbook on surgery to the needs of the student. In many respects this book is an excellent summary of clinical surgery. Little or no surgical technic other than the principles of operations is included. cursory descriptions of clinical diagnostic features and brief pathologic anatomic descriptions are the chief contents. The book begins with some fundamentals of bacteriology essential to the surgeon and with certain specific infectious diseases. It then proceeds to the various surgical problems associated with regional disorders and concludes with an excellent section on orthopedic surgery.

Such a volume is necessarily dogmatic and for the sake of brevity resorts to the outlining of many details. Frequent and excellent illustrations usually supplement any inadequacies in the text. There are numerous photographs and many colored drawings, which the high quality of paper employed flatters to the utmost. This is a feature lacking in many otherwise good surgical textbooks.

It is possible for the student to absorb from this a considerable number of highlights on surgical problems. For thorough study and reference, however, it hardly supplies sufficient information. A bibliography is not included for supplemental study, although brief biographic footnotes are an interesting addition to almost every page. The value of the book lies in its succinct clarity and the attractive style in which it is written. It represents again a typical surgical volume prepared for British students and contrasts clearly with textbooks used in this country.

The Mask of Sanity: An Attempt to Reinterpret the So-Called Psychopathic Personality. By Hervey Cleckley, B.S., B.A., M.D., Professor of Neuropsychiatry, University of Georgia School of Medicine, Augusta. Cloth. Price, \$3. Pp. 298. St. Louis: C. V. Mosby Company, 1941.

As a psychiatrist in the United States Veterans Administration the author became interested in that nosological wastebasket known as "psychopathic inferiority" and its minor diagnostic variations. He has given much thought to these conditions and has set forth his studies and conclusions in a serious and scholarly work. Cleckley has a flair for the literary, so that in spots he romanticizes his subject and in places he has recourse to the technic of sensational reporting; but these passages need not divert the reader from an extremely worthwhile account of the subject of psychopathic personalities. The difficulties of treating these patients under our existing insanity codes is thoroughly presented and their prevalence estimated. The author then presents fifteen detailed and illuminating case histories. He summarizes existing opinion regarding the group, differentiates it from other entities and sharply outlines and circumscribes the clinical syndrome. Finally he attempts an interpretation of the clinical process and discusses therapy. Use is made of dynamic concepts, and a good grasp of the basic problems is evidenced by the author. He uses the term semantic dementia as indicating a loss of grasp or utilization of the significance or meaning of experience. The book is highly recommended.

Inter-Relation of Abdominal Diseases. By Elemér Forrai, M.D., L.R.C.P. With a foreword by Sir Arthur Hurst, M.A., D.M., F.R.C.P., Consulting Physician, Guy's Hospital, London. Cloth. Price, 12s. 6d. Pp. 168, with 5 illustrations. London: William Heinemann, Ltd., 1941.

The author develops the thesis that all the organs of the gastrointestinal and hepatobiliary tracts should be considered as belonging to a single system. This conclusion is based on the fact that they have a common embryologic origin, similar nervous and reflex pathways, the various organs are frequently invaded by identical bacteria and there is often a pronounced familial predisposition to disease of one or more units of this system. These and other factors prove the close interrelationship in a pathologic and clinical sense between various parts of the system and help to explain the frequent coexistence of chronic disease in the gallbladder, appendix, duodenum, stomach and liver. This conception also throws some light on residual symptoms so frequently present after removal of a chronically involved gallbladder or appendix, since several organs or even the entire system are usually involved and removal of the gallbladder or appendix serves only to eradicate but a small segment of the diseased whole. It has been known for some time that peptic ulcer and chronic gallbladder or appendiceal disease coexist in the same patient, but this is the first time that such a comprehensive view has been offered in explanation of this phenomenon. A careful survey of the literature and a study of the author's own material constitute the basis for his conclusions, which, in addition to the foregoing, also include views on the role of the liver in the production of allergy, on the thyroid and on the significance of heredity in relation to intra-abdominal disease. The critical reader may not agree that all statements made by the author actually support his thesis. Certainly such far reaching conclusions should be checked by a greater series

of controls. But these criticisms in no way detract from the value of this book as a thought provoking and scholarly attempt to explain the troublesome failures which so frequently follow medical and surgical treatment of chronic disease of the digestive tract.

Hemorrhoids and Their Treatment: The Varicose Syndrome of the Rectum. By Kasper Blond, M.D. Translated by E. Stanley Lee, M.S., F.R.C.S. Cloth. Price, \$4.50. Pp. 140, with 49 illustrations. Baltimore: William Wood & Company, 1940.

The first five chapters are devoted to the etiology, symptomatology, diagnosis, investigation and treatment of hemorrhoids. In twelve years the author has performed 3,100 injections. "In 1935, after some 2,000 cases had been treated without serious complication, there occurred in rapid succession two fatalities." The author calls his treatment the "vein compression method and it consists of injections of about 8 minims of 20 per cent solution of quinine bihydrochloride, urethane, procaine and tincture of catechu (20 per cent)." This injection is made "round the bowel in a clockwise sequence, under the mucosa at a level above the hemorrhoids." It is claimed that "the cure is usually complete in five to seven treatments," although one patient "required more than twenty." The author claims that "the fissure owes its existence to a thrombosed varix" and "piles are found in 100 per cent of the cases." He also states that "fistula in ano is a suppurative thrombophlebitis" and that "the underlying cause of fistula is the hemorrhoids." Therefore, he says, "it follows that the treatment of fistula must begin with the treatment of hemorrhoids." In like manner the author deals in remaining chapters with the subjects of constipation, pruritus, proctitis, fistula, prolapse, biliary disease and varicose veins, and each problem is finally reduced to the same common denominator: The cause of the disease is "venous back pressure," and the "venous compression treatment" cures all disorders which occur caudad to the area where the treatment is given. The author admits that many of his ideas are the same as those of the physicians of an early day. It is his idea that the modern physician is in error because he rejects many of the old schemes. The volume consists, in part, of claims and opinions which probably will not find general acceptance. Many of the illustrations are in color.

Growing Out of Babyhood: Problems of the Preschool Child. By William S. Sadler, M.D., F.A.P.A., Chief Psychiatrist and Director, the Chicago Institute of Research and Diagnosis, Chicago, and Lena K. Sadler, M.D., F.A.C.S., Associate Director, the Chicago Institute of Research and Diagnosis. Cloth. Price, \$2.50. Pp. 350. New York & London: Funk & Wagnalls Company, 1940.

This book has been prepared particularly for mothers, nurses and governesses and is devoted to the psychologic, psychiatric and sociologic problems of the preschool period. It attempts to furnish parents with definite instructions for dealing with the specific behavior problems that arise during this period. It contains much material collated from a variety of sources. The introductory chapters deal with the normal child, while the largest portion of the book is devoted to the common problems of the preschool period; namely, bowel and bladder training, thumb sucking, nail biting, temper tantrums, obedience and discipline. The latter chapters are concerned with the adjustment of the child to the group and parent-child relationships. While this material is not new, it is well presented, clearly written and should aid parents in correcting behavior problems. Because of the amount of material included, there is some question as to how much of the information and instruction will be grasped by average parents.

Age Morphology of Primary Tubercles. By Henry C. Sweeney, M.D., Medical Director of Research, Municipal Tuberculosis Sanitarium, Chicago. Cloth. Price, \$5. Pp. 265, with 73 plates. Springfield, Illinois & Baltimore: Charles C. Thomas, 1941.

Based on the idea that practically all biologic phenomena are more or less functions of time, the author has made a rather comprehensive study of primary tubercles. He presents evidence in support of the thesis of the relationship of age to morphology of primary tubercles. He presents the interesting analogy of the aging tubercles to the various changes in the earth which become understandable in the science of geology. The application of "morphology" criteria may be applied prac-

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tically to approximate the time of contact, the location of the source of contagion in conjugal infection, the relation of the onset of tuberculosis to other diseases. This method may also prove useful in medicolegal work and in government compensation following military or naval service. The author admits the controversial nature of the subject. Further study is necessary to confirm this theory, and it is questionable whether one can go as far as the author has in his deductions.

The Prevalence of Disabling Illness Among Male and Female Workers and Housewives. By David E. Hallman, Senior Administrative Assistant, United States Public Health Service. From the Division of Public Health Methods, National Institute of Health. Prepared by direction of the Surgeon General, Federal Security Agency, U. S. Public Health Service. Public Health Bulletin No. 260. Paper. Price, 10 cents. Pp. 40, with 10 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

The classification of the data collected by the National Health Survey according to age, employment and sex indicates that the rate of illness as measured by the proportion of persons disabled on the day of the visit was 48 per cent higher for females in the ages 15-64 than for men. The rates for industrial workers in the same age group were 32 per cent higher for males and 17 per cent for females than for those in the business, professional and clerical classes. For cancer and other tumors, nervous and mental diseases, tonsillitis and a number of other diseases, the female rate was much higher than the male, while the male rates were high for hernia, ulcer of the stomach and duodenum, occupational accidents, hemorrhoids and pneumonia. While there were these significant differences between the sexes, the curves of sickness rate for the two sexes in all classes followed much the same pattern.

Corner Druggist. By Robert B. Nixon, Jr. Cloth. Price, \$2.50. Pp. 291. New York: Prentice-Hall, Inc., 1941.

The doctors and the dentists and the lawyers and the editors have been writing their autobiographies, and in some instances their sons have been exploiting their careers. Now comes the biography of a corner druggist, written by his son. It is a lively book, and any one who has wasted his hours gossiping with the druggist at night back of the prescription counter, or more recently behind the soda fountain, knows that the druggists have a lively time. Not all of their spare time is spent in selling stamps. The corner druggist, whose story is told here, was a druggist of the old school. Apparently in the old days they were frequently besought to provide pills for removing the premature progeny of seduction; they prescribed for venereal disease, and they advised the family about conditions in general. Modern scientific pharmacy is apparently removing some of the romance from this lively profession, but it is amusing and interesting to read what the druggist of an earlier day contended with.

Trudy Rostovskogo na Donu Gosudarstvennogo Meditsinskogo Instituta. Sbornik IV. Otvetsvennyy redaktor: N. A. Bogoraz. [Publications of the State Medical Institute of Rostov-on-Don. Fourth Collection.] Paper. Price, 9 rubles. Pp. 216, with 56 illustrations. Rostov-on-Don: Rostovskoe Oblastnoe Knigolzdatel'stvo, 1939.

Trudy Rostovskogo na Donu Gosudarstvennogo Meditsinskogo Instituta. Sbornik V. Otvetsvennyy redaktor: N. A. Bogoraz. [Publications of the Rostov Medical Institute. Volume V.] Paper. Pp. 319, with 103 illustrations. Rostov on Don: Rostovskoe Oblastnoe Knigolzdatel'stvo, 1939.

Trudy Rostovskogo Gosudarstvennogo Meditsinskogo Instituta. Sbornik VI. Pod redaktsiyey: K. Z. Yatsuta. [Publications of Rostov Medical Institute. Volume VI.] Paper. Price, 12 rubles. Pp. 295. Rostov on Don: Rostovskoe Oblastnoe Vedomstvennoe Izdatel'stvo, 1940.

Volumes IV, V and VI of the Publications of the State Medical Institute of Rostov on Don contain a motley of papers on clinical and experimental work reflecting an average standard for medical institutes of the Soviet Union. A review of the material is not possible because of the number and the variety of subjects treated.

National Board of Medical Examiners. Examination Questions, Parts I and II. Revised to October 1, 1940. 1936-1940. Bulletin No. 2. Paper. Price, 25 cents. Pp. 155. Philadelphia, Pa. U.S.A.

This compilation of questions used by the National Board of Medical Examiners doubtless fills a want on the part of certain poorly qualified students preparing for this test. Further, it gives aid and comfort to those instructors who permit their courses to degenerate to the level of an examining school. Whether it serves any useful purpose does not appear.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

PULMONARY TUBERCULOSIS AND HOT CLIMATE

To the Editor:—A woman aged 28, who is being treated for pulmonary tuberculosis (compression has been performed) has greatly improved, being bacillus free and afebrile. She is about to be married. Her prospective husband's occupation necessitates living in the tropics and, at times, on the coast of Peru, where the climate is hot. I should like to know how patients who have been tuberculous can stand the tropics and shall appreciate any information you can give me.

L. H. Hoffman, M.D., San Francisco.

ANSWER.—There need be no hesitancy in going to a hot climate so long as the treatment of the disease can and will be properly carried out. The patient must have adequate rest for the particular stage of her disease, be kept comfortable and contented and be maintained on a good modern diet. If the collapse is to be continued, it will be necessary to stay near some competent man who can administer it. At Lima there are such men and perhaps these men may be able to recommend others. The only obvious danger is the possibility of having to go to high altitudes with too much lung collapse. This should be done carefully, as an adequate sea level pressure in the pleural cavity may become too great at high altitudes. It would be better to ascend in stages of only a few thousand feet at a time, and only under the care of a competent physician.

CHRONIC SINUSITIS AND PEPTIC ULCER

To the Editor:—In the past year a patient has had gastric and duodenal ulcers. In 1918 he had an acute infection involving all the sinuses. The condition finally became chronic. There were many acute flare-ups superimposed on a more or less chronically active state. In the fall of 1918 he experienced a loss of the sense of smell and a diminished sense of taste. These losses have never been regained. What effect would the loss of these senses have on normal gastric secretion? Would the continuous swallowing of pus from these sinuses be considered a primary or a secondary cause of gastric ulceration? Would these losses contribute to ulcer formation? From 1918 to 1935 he experienced gastric disturbances. In May 1935, following an acute attack of sinusitis, he had acute gastritis, which subsided under treatment. The condition became chronic. Prior to the development of a gastric ulcer in 1940 he suffered an acute attack of sinusitis.

M.D., New York.

ANSWER.—The mechanism of normal gastric secretion in response to a meal consists of three phases: the psychic, the gastric and the intestinal. In addition there may be a continuous secretion, variable in amount, which is not dependent on the intake of food. The sense of taste and the sense of smell can influence only the psychic phase of gastric secretion. The volume of gastric juice secreted during the psychic phase may vary considerably from one person to another and in the same person from meal to meal. On the basis of Carlson's (*The Control of Hunger in Health and Disease*, Chicago, University of Chicago Press, 1916, pp. 232-247) observations it seems reasonable to assume that in general the psychic gastric secretion does not amount to more than one fifth of the total secretion of the stomach and that it might well be less.

Carlson found that "significant appetite secretion in man is that induced by tasting and chewing good food." The secretion of gastric juice produced by seeing, smelling or thinking of food was relatively slight and inconstant. Furthermore, the mere act of chewing (paraffin) was found not to stimulate gastric secretion. This suggests that the sense of taste is an important factor in the production of appetite secretion. It does not, however, indicate that the inability to taste food completely abolishes the psychic phase of gastric secretion.

The effect of the loss of the sense of taste and the sense of smell on the total volume of gastric secretion would seem, therefore, to be at most a slight, probably insignificant, decrease. There is no evidence to indicate that the loss of these senses leads to the formation of chronic peptic ulcers.

Although acute sinusitis, chronic sinusitis and exacerbations of chronic sinusitis have sometimes been mentioned as possible causes of chronic peptic ulcer, this is highly questionable. Whether a patient who has had a peptic ulcer is predisposed

to a recurrence by infection of the sinuses or, indeed, by infection anywhere in the body is not known but seems unlikely. It has been stated, but not proved, that persons with peptic ulcers have a higher incidence of chronic infections, including sinusitis, than those who do not have peptic ulcers. Hurst and Stewart (*Gastric and Duodenal Ulcer*, Oxford University Press, 1929, p. 48) in discussing this subject add, however, that "the clinical evidence for this is not absolutely conclusive, as chronic infections are so common that the possibility of coincidence requires consideration." Considerable coincidence would be bound to occur and, for this reason, such statistical studies are difficult to evaluate.

It might seem reasonable to expect the swallowing of infectious discharges from the sinuses to lead to some changes in the mucosa of the gastrointestinal tract. This may well occur, but it has not been shown that chronic peptic ulcers result. It should be noted that gastric contents with a pH value of 3 or less have been found to have a bactericidal effect (Hood, Marion, and Arnold, Lloyd: *Am. J. Digest. Dis. & Nutrition* 4:40 [March] 1937). It is significant, however, that the healing of chronic peptic ulcers in man and similar experimental ulcers in animals is promoted by antacid therapy which maintains the gastric contents at a pH value above 3 (Palmer, W. L.: *Fundamental Difficulties in the Treatment of Peptic Ulcer*, *THE JOURNAL*, Nov. 18, 1933, p. 1604). The gastric flora, which is largely determined by the flora in the oral cavity and the upper part of the respiratory tract, apparently has little influence on the healing of such ulcers.

It would appear, therefore, that infection of the sinuses has no known role in the pathogenesis of chronic peptic ulcers.

TESTOSTERONE PROPIONATE FOR PROSTATIC HYPERTROPHY

To the Editor:—Will you please give me the consensus as to the usefulness of testosterone propionate in benign prostatic hypertrophy. If of use, what is the recommended manner of use?

William J. Hall, M.D., McKees Rocks, Pa.

ANSWER.—In the report on this substance by the Council on Pharmacy and Chemistry, the first sentence reads "Within the past few months extravagant claims for the action of the male sex hormone testosterone have appeared in professional and lay publications." This sentence, distinguished by restraint, introduces an excellent review of the literature pertinent to the use of testosterone propionate. The report is concluded by a refusal to include this substance in New and Nonofficial Remedies.

Since the publication of this report in 1939, many articles have appeared concerning the use (and misuse) of testosterone. It has been advised for the treatment of most of the ailments of males, from delayed puberty to old age, from undescended testes to impotence and prostatic hypertrophy, for enuresis and acne. Even females are not exempt, for it is advised in the treatment of many of their complaints, including menorrhagia. From a cursory examination of this mass of prematurely published and poorly considered literature, it might be assumed that in testosterone there is the answer to "all of the acute and chronic diseases of men, women and children."

Actually, testosterone propionate is an excellent substance. It is one of the few pure, synthesized hormones yet made available. It is an extremely valuable substance for the treatment of patients suffering from a lack of this substance—such as those who have eunuchoidism. When all the nonsense written about it is forgotten, testosterone propionate will have an honored place in the medical armamentarium.

In answer to the specific question, it may be said "There is no scientifically acceptable evidence that testosterone is of permanent value in the treatment of prostatic hypertrophy." This statement is made in spite of such enthusiastic claims as those of Triasoff, who reported good results with the substance in 23 of 27 cases of prostatic hypertrophy. The answer is based rather on such excellent work as that of Heckel, who concluded his thorough study by stating:

"Testosterone propionate in daily intramuscular injections produced little improvement in the symptoms and clinical course of 22 patients with benign prostatic hypertrophy.

"It did not produce any noteworthy reduction in the residual urine.

"The histological examination of the prostate gland from the patients who were previously treated with testosterone propionate showed no variation from the histological sections from untreated patients.

"Testosterone propionate produces a temporary depletion of spermatozoa in patients that have spermatozoa counts within normal limits. In 10 of 12 patients an oligospermia was produced.

"These data would indicate that this material is of little benefit in the treatment of benign prostatic hypertrophy, and its promiscuous use over a long period of time in patients with normal testicular function might be harmful."

The lack of any change in the histologic aspects of the gland after therapy with propionate also has been reported by Sharpey-Schafer and Shackman.

Perhaps, in some cases, some subjective improvement has been obtained by such treatment, but, as Heckel wrote, "The benefits that did occur were mild and were no greater than the improvement commonly seen when the patient is prescribed soda and sitz baths. It seems, therefore, improbable that the hormone caused any beneficial effects."

It is more likely that testosterone will have a valuable role in the treatment of underdevelopment of the prostate gland. McCullagh and McGurl reported that "the prostate glands in 6 cases of prepuberal hypogonadism have grown in some cases from almost no palpable prostatic tissue to approximately normal size."

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POSSIBLE PULMONARY ASPERGILLOSIS

To the Editor:—I have a roentgenogram which is suggestive of numerous small, discrete calcified pulmonary lesions with a hematogenic distribution which, on account of the history, suggests infection with *Aspergillus*. I would appreciate any information or references you can give me with regard to this. Is the condition likely to produce gastric symptoms similar to those occasionally produced by pulmonary tuberculosis?

Arthur E. Perley, M.D., Waterloo, Iowa.

ANSWER.—With such meager data it is impossible to arrive at a conclusion as to the cause of the discrete dense shadows in the lung as seen roentgenographically. What in the history suggests infection with *Aspergillus*?

The following information may be offered: Since 1842, when pulmonary aspergillosis was first described, there has been much discussion as to whether the infection is primary or secondary. Primary infection of the lung has been rarely reported by American authors. Generally, writers in this country are loath to accept the theory of primary infection, and many even question the pathogenicity of the fungus under any circumstances. Among European authors, especially the French, primary aspergillosis is accepted as an entity and not infrequently reported as such.

Pathologists in this country concur with clinicians that aspergillosis of man as a primary process is rare, but that as an accompaniment of many pulmonary lesions such as old infarcts, bronchitis (Weidman, F. D.: *Arch. Path.*, 13:725 [May] 1932), bronchogenic carcinoma (Kampmeier, R. H., and Black, H. A.: *Am. Rev. Tuberc.*, 30:315 [Sept.] 1934) and especially pulmonary tuberculosis (Edwards, J. C.: *New England J. Med.*, 213:15 [July 4] 1935) it is not common.

Pathologically the lesions appear essentially as bronchiectasis or edematous necrosis (Weidman). Nowhere in the early literature is mention made specifically of fibrosis and calcification as part of the process. Because of the almost invariable superimposition of aspergillosis on another pathologic entity, at least as noted in this country, any calcification present may have been due to the underlying or primary disease.

In 1932 Sayers and Meriwether (*Am. J. Roentgenol.*, 27:337 [March] 1932) stated that they had isolated *Aspergillus* from the sputum of 31 patients who had what appeared roentgenographically to be typical healed miliary tuberculosis of the lung. There was no evidence that the fungi present were the cause of the shadows in the lungs. Experimentally produced aspergillosis has never resulted in calcified lesions. Bethune and Moffatt (*J. Thoracic Surg.*, 3:86 [Oct.] 1933), who produced experimental aspergillosis in guinea pigs, rats and rabbits, concluded that there was no evidence to favor the theory that *Aspergillus* may be responsible for extensive fibrosis and nodular calcification as seen in some roentgenograms of human beings.

The rare clinical cases that appear to be primary aspergillosis also support the pathologists' views. Cannon (J. Thoracic Surg., 2:266, 1932).

Surg. 4:533 [June] 1935) reported a primary case in which there were relatively slight pulmonary lesions and no evidence of extensive fibrosis or calcification. There has apparently been no reported case of uncomplicated aspergillosis with calcification as a feature.

It is probable that aspergillosis of the lungs, should it be present, would be apt to be accompanied with symptoms of disturbance of the gastrointestinal tract such as may occur in pulmonary tuberculosis.

BLUE SCLERAS AND BRITTLE BONES

To the Editor:—What is the significance of blue scleras in a 2 year old girl? She is apparently normal. What are the possibilities of her acquiring fragilitas ossium, although there is no other evidence at present? What sort of a check-up (including laboratory methods) should she have? The blue scleras have been present from birth, but the shade of blue has increased in intensity.

M.D., New Jersey.

ANSWER.—The blue color of the sclera is imparted by the choroidal pigment. Whether this is made possible by an unusual transparency or by thinness of the sclera is a question of mild controversy.

Approximately 60 per cent of adults with blue scleras have brittle bones. About 60 per cent have associated deafness, while in 44 per cent all three conditions may be present (Fox, M. S., and Sweet, S. J.: *Brittle Bones Associated with Deafness and Blue Scleras*, *Arch. Otolaryng.*, 32:506 [Sept.] 1940). Brittle bones and blue scleras are associated also with relaxed ligaments and the syndrome is hereditary. It follows the mendelian law of inheritance and is a disturbance of the mesenchyme, from which all of the structures involved in the complete syndrome are derived.

If the family history of this child is known and there have been no records of cases of fragilitas ossium, the chances are that a 2 year old girl will have no difficulties from the standpoint of pathologic fractures (McGarry, H. H.: *Osteopsathyrosis* [Fragilitas Ossium], *Canad. M. A. J.*, 41:354 [Oct.] 1939).

PORT WINE NEVUS

To the Editor:—Would it be right to treat a port wine mark which covers almost half the face and half the body of a newborn infant? What is the best method? The mark is not raised.

M.D., New York.

ANSWER.—Unfortunately there is no satisfactory method of treating a port wine nevus. In a case of this sort treatment will be without benefit. The stain on the face can be satisfactorily disguised by the skilful application of a protective cosmetic cream such as "Cover Mark." Treatment is apt to make the condition worse by producing scarring. Under no circumstances should radium or roentgen rays be used.

YEASTS IN URINE AND PROSTATE

To the Editor:—I would like to supplement the remarks in answer to a query in *The Journal*, Jan. 25, 1941, page 356, under the heading "Yeasts in Urine and Prostate." My attention was called to this condition in 2 boys in their teens who had other diagnostic combinations but consistently had yeast and molds in both the urine and the prostatic secretion. After scrutiny of the literature and further studies I come to the conclusion that the condition is not as rare in the genitourinary tract as the answer to the query implies. I have found it more frequently in the urine from the male bladder than that of women. I do not know why. In the answer to the query it is stated that the "occurrence of yeast in the prostatic secretion is even more rare." This has not been my experience, as I have found yeast in the prostatic secretion of scores of men. The answer recommends irrigations of the bladder; while I find that they are helpful and soothing, at the same time I believe that they produce quicker and better results. My observations are also indicated to urologic manifestations have always been in connection with some other entity, and therefore the combination is associated in what I term "pathologic symbiosis." I feel that too little research has been done along this line and that too little has appeared in the medical literature. While infection with yeast is probably a dual infection, at the same time the end result manifests itself as a dual infection, the same teneous and chronic manifestations. With the advent of the new chemical drugs I felt hopeful that specific cures would result. While in the treatment, I have been disappointed that the percentage of cures has not been larger. I have one little boy who has shown decided improvement with the use of sulfathiazole and to a lesser extent sulfonamide. These modern drugs I used with less success alternating courses of treatment with gradually increasing doses of saturated solution of potassium iodide (at one time considered the best and most reliable drug in these conditions) and 1 grain (0.06 Gm.) doses of methylene blue over periods of several months with rest periods of several months.

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